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BUREAU OF EDUCATIONAL RESEARCH
COLLEGE OF EDUCATION

TRAINING IN THE TECHNIQUE OF STUDY

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PREFACE

For several years interest has been manifested in the problem of supervising or directing the study of school children, particularly in the high school. It is generally agreed that good study procedures are a valuable asset to a student. One who knows how to go about the preparation of his lessons has a decided advantage over one who begins his studying in a random and haphazard way.

The significance of an effective technique of study justifies the recognition of study habits as important educational objectives. In this bulletin we present the results of an inquiry into the study habits of high-school students, and the possibility of training them to employ good procedures. The investigation was made by Mrs. Dora K. Mohlman under the immediate guidance of the Director of the Bureau of Educational Research. Although the results of the inquiry are somewhat unsatisfactory, it is believed that a description of the procedures employed, particularly the directions and exercises for giving training in study habits, will be helpful to teachers. It is with this hope in mind that the report is published.

WALTER S. MONROE, *Director*

September 29, 1924.



TRAINING IN THE TECHNIQUE OF STUDY

CHAPTER I

INTRODUCTION

Failures of students in high schools. Recent studies of failures in high school have served to emphasize the fact that a large percent of the students do not pass successfully the studies which they undertake. The figures given below, describing conditions in one group of high schools, are taken from an extensive study by O'Brien¹ and are probably fairly representative of conditions in general.

	All entrants	Failed in at least one subject	All graduates	Failed in at least one subject
Total	6,141	3,573 (58.2)	1,936	1,125 (58.1)
Boys	2,646	1,645 (62.1)	796	489 (61.4)
Girls	3,495	1,928 (55.1)	1,140	639 (55.8)

The fact that more than half of those graduating from high school have failed during their school career in at least one subject shows a lack of efficiency which should receive the thoughtful consideration of those of us who are responsible for this division of our educational system. We are not justified in claiming that the students are altogether to blame or that such a high percent of failures must be expected if defensible standards are maintained. Even a casual inquiry indicates that some of these failures are due to certain maladjustments in the organization of the school, in the course of study and in the methods of instruction.

Adjustment of subject-matter to the interests and needs of students. Among the causes which contribute to failure in high school is a lack of adjustment of the curriculum to the interests and needs of the students. A learner's success is potently influenced by

¹O'Brien, Francis P. "The high-school failures. A study of the school records of the pupils in academic or commercial high-school subjects." Teachers College Contributions to Education, No. 102. New York: Teachers College, Columbia University, 1920. 97p.

his estimation of the relation of the subject-matter to his own life. If he recognizes a task as one that satisfies a felt need or that appeals to his interest he will usually apply himself with diligence and persistence; if on the other hand he fails to see in the assignment anything that relates to his own experiences, he is likely to approach it with indifference and to become discouraged easily. Existing mal-adjustments of subject-matter are being recognized and corrected to some extent through our various curriculum construction activities.

Educational guidance as a means of securing adjustment to the individual differences of students. Recent scientific investigations have gone far in revealing the nature and the extent to which individual differences exist among the boys and girls enrolled in our high schools. Instead of having to deal with a school population which is characterized by homogeneity of interests and purposes, we now realize that our students differ widely in these respects. Educational guidance represents our efforts to direct students in their educational career so that their choice of subjects will be more nearly compatible with their individual interests and capacities.

Adjustment through appropriate training in study procedures. Although significant increases in the efficiency of our high schools will result undoubtedly from the reconstruction of the curriculum and from educational guidance, there is evidence to indicate that many students are materially handicapped in their efforts to learn because they have not been given appropriate training in the technique of study. Instruction in the procedure of *doing* the tasks set by the school will doubtless result in an improvement in the achievements of these students and in a consequent decrease in the number of those who fail.

Purpose of this investigation. The purpose of the investigation reported in this bulletin is: (1) to secure evidence of the influence of the technique of study upon success in certain high-school subjects; (2) to devise means of giving training in the technique of study; and (3) to observe the effect of certain methods of training.

CHAPTER II

GENERAL REPORT OF INVESTIGATION

General plan of investigation. This investigation was conducted during the school year of 1922-23 under the direction of Mrs. Dora K. Mohlman, an assistant in the Bureau of Educational Research. As subjects for the experiment, Principal L. W. Williams of the University High School designated ten students who seemed representative of those whose work was unsatisfactory. Mrs. Mohlman herself was in charge of the specific training in technique of study reported in this bulletin, and devoted a certain portion of each day for a period of ten weeks to this work. At times the instruction was given to each student individually, at other times, to the group as a whole. As two of the students selected left school during the period of training, this report is based upon the records of the eight remaining throughout the investigation.

Standardized tests used. In order to secure information concerning the capacity of these pupils to do school work, the following standardized tests were administered at the beginning of the experimental period:

Otis Group Intelligence Scale, Advanced Examination, Form A

Terman Group Test of Mental Ability, Form A

Monroe Standardized Silent Reading Test III, Form 1

Thorndike-McCall Reading Scale, Form 2

Haggerty Achievement Examination in Reading, Sigma 3

Holley Sentence Vocabulary Scale, Series 3A

Burgess Picture Supplement Scale, Form I

Memory for Serial Impressions, The Method of Letter Squares¹

Memory for Ideas, The Marble Statue²

Additional information secured. Certain informal tests were given also, personal interviews were held, and a detailed inquiry was made into the physical condition, previous school record, attitude toward school work, vocational aim, home conditions and general study habits of each student. The blank used to record these specific items is reproduced on p. 10. The section which relates to general

¹Whipple, G. M. Manual of Mental and Physical Tests, Part II: Complex Process. Baltimore: Warwick and York, 1915, p. 162-64.

²*Ibid.*, p. 205-11.

study procedure was found to be only partially satisfactory because the process of effective study has not been analyzed as yet and no one knows just what information should be collected in order to reveal a student's technique of study.

INFORMATION BLANK

- Name.....Age.....School.....
 Grade.....Date.....
- I. Schools previously attended?.....
 - II. Grade or grades "skipped"?.....Why?.....
 - III. Have you ever remained out of school for a protracted period?.....
 How long?.....In what grade?.....
 Why?.....
 - IV. What subjects are you now taking?.....
 - V. Which subject do you like best?.....Why?.....
 - VI. How do you like other subjects?.....
 (Give subjects which you are now studying other than those mentioned in Question IV.)
 Why? (Ask after each one.)
 - VII. Which school-subject among all you have taken in any grade do you like best?.....Why?.....
 Least?.....Why?.....
 - VIII. Do you like to read?.....Why?.....
 Do you read much at home?.....
 If not, why?.....
 Do you read rapidly or slowly?.....Do you understand what you read?.....
 - IX. Grades at end of first semester?.....
 - X. List below subjects studied since entering high school and grades received. Underline those subjects in which you failed.
 - XI. Are you planning to complete high school?.....To go to the university?.....
 - XII. Have you chosen your life work?.....If so, what is it?.....
 - XIII. Has student been absent from school so much that it is felt that his school work materially suffers thereby?*
 - XIV. Relationship between student and his fellow students?.....
 - XV. Additional facts concerning school history which might explain cause of study difficulties.
 1. Does student do work of any sort outside of school?.....
 2. How many hours per day?.....
 3. Is previous school training noticeably inadequate?.....
 4. Disciplinary difficulties?.....Causes?.....
 5. Is there evidence that the student lacks ability to do adequate school work?.....What is the evidence?.....
 6. Is there a lack of encouragement of student in the home and failure of the home to back policy of school?.....
 7. Is the student's home life happy?.....

*The answers to this question as well as to questions XIV and XV were obtained from consultations with the teachers or from other sources.

8. Is student worrying over a misfortune to any member of his family?.....
9. Temperamental difficulties—emotional, instability, erratic behavior and reactions.....
10. What seems to be student's difficulty in his work?.....
11. What serious illness has student had?.....
12. Present physical condition.
 - A. Health-general—Find out concerning weak lungs, heart, ease with which takes cold.....
 - B. Nervousness.....
 - C. Amount of sleep—Usually from about..... to.....
 - D. Exercise (What and approximately how much per day).....
 - E. Defects—eyesight, hearing, etc.....
 - F. Personal habits.....
13. What special interests which might be utilized in overcoming study difficulties has the student exhibited?.....
 - In school activities?.....
 - In outside activities?.....

XVI. General study procedure.

1. About how much time have you been in the habit of spending on home study since you entered high school? (Amount of time spent and when.).....
2. Are you in the habit of receiving help at home on your lessons?.....
3. What subjects, if any, do you study regularly at home?.....
 - Only at school?.....
 - At home and school both?.....
4. Do you have any particular room in which you study?.....
5. Are there people in the room in which you study?.....
 - Who are they, and what do they do while you study?.....
6. Is there anything about the light, heat or air of the room that makes you uncomfortable as you study?.....
7. Do you have a desk or table?.....Is it comfortable to work there?.....
8. When do you usually study at school?.....
9. Is there anything about the heat, light, ventilation of the schoolroom and of your desk which makes it uncomfortable for you to study there?.....
10. Have you a regular time at which you study each lesson?.....
11. Do you do all your studying on one subject at a time or do you study it at various times?.....
12. Do you find your mind wandering while you study?.....
 - Very often?.....
 - In your classes?.....
13. Do you stop and do other things while you study?.....
14. Do you have around objects and books other than the book you are studying?.....What are they?.....
15. In case you have to do a hard piece of work and an easy piece of work, which would you do first?.....
16. Do you attempt to pick out the most important parts or topics in your assignment and study them most?.....
17. After you have learned something new—a rule, etc.—do you make an effort to use it so that you will remember it better?.....
 - To find an example of it?.....
18. Do the teachers always make the assignments clear so that you know exactly what they wish you to do or are you sometimes not sure? Do you ever seem to study what the teacher doesn't want?.....

19. Has anyone ever tried to tell you how you should go about studying other than to tell you to do it?.....In what subject or subjects?.....What sort of directions did they give you?.....
20. Do you ordinarily keep on studying until you feel positive that you have a lesson thoroughly learned or do you stop before being sure that you know it thoroughly?.....

Capacity to do school work. The information given by the standardized tests relative to the capacity of the eight students to do school work is summarized in Table I. Although the evidence is characterized by some lack of agreement, certain statements appear to be justified. Two of the subjects, R. R. and M. F., are average or above average in capacity. The group intelligence tests indicate that J. B. possesses average ability, but his scores on the other tests are distinctly below the norms. L. W. and H. W. probably are not grossly lacking in ability although their scores are inconsistent. T. H. and W. J., the two poorest students in the group, are clearly below average in capacity.

TABLE I. INFORMATION RELATIVE TO CAPACITY TO DO SCHOOL WORK

	STUDENTS							
	R. R.	J. B.	L. W.	H. W.	T. H.	M. F.	M. W.	W. J.
Sex.....	B	B	B	G	B	G	G	B
Grade.....	X	X	XII	X	IX	IX	IX	IX
Chronological age.....	19-6	18-7	19-4	16-6	14-0	13-7	16-10	16-6
Memory for Serial Impression*.....	190	150	197	150	140	191	182	151
Memory for ideas.....	41	28	32	30	23	42	32	19
Age norms.....	38.3	36.9	38.3	37.3	36.1	38.5	37.3	34.3
Terman Point Score.....	111	121	96	98	82	88	74	56
Mental age.....	14-10	15-3	14-1	14-4	13-5	13-8	13-3	12-3
Otis Point Score.....	132	163†	142†	112	97	142	110	88
Mental Age.....	18-0†	18-0‡	18-0‡	14-0	12-9	18-0†	13-10	12-0
Holley Vocabulary.....	69	43	59	55	41	51	51	40
Grade norms.....	55	55	69	55	48	48	48	48

*Average scores: Age 13, 156.9; age 14, 165.6; age 15, 170.8; age 16, 181.6.

†These scores were obtained from a second application of the test. There was evidence to show that the scores obtained from the first trial were inaccurate.

‡In the norms for this test 18 is given as the age equivalent for the score of 130. Thus, all scores above 130 have been translated into a mental age of 18 years.

TABLE II. MEASURES OF ABILITY IN SILENT READING

	STUDENTS							
	R. R.	J. B.	L. W.	H. W.	T. H.	M. F.	M. W.	W. J.
Monroe Silent Reading Test								
Rate.....	86	86	77	77	77	86	77	55
Grade Norms.....	85	85	96	85	83	83	83	83
Comprehension.....	25	40	28	28	12	19	17	0
Grade Norms.....	25.4	25.4	30.0	25.4	23.0	23.0	23.0	23.0
Thorndike-McCall Reading Scale								
Score.....	53	51	49		45	47	49	39
Grade Norms.....	62.9	62.9	66.8		61.5	61.5	61.5	61.5
Haggerty Reading Examination								
Score.....	79	75	78	88	60	72	75	48
Grade Norms.....	90	90	102	90	84	84	84	84
Burgess Picture Supplement Scale								
Score.....	12	7	5	15	6	10	7	5
Grade Norms*.....	13	13	15	13	12	12	12	12

*These norms have been estimated from those given for grades II-VIII. It was presumed that the standards would increase one for each grade of the high school as for each of the upper elementary grades.

Ability in silent reading. The measures of silent reading ability are summarized in Table II. In interpreting this table the reader should bear in mind that Monroe's Standardized Silent Reading Test III measures skill in reading simple material and that the other two tests are designed to measure power to read difficult material. R. R. and J. B. are shown to be skillful in reading easy material, but are lacking in power. As study seems to be more closely related to power than to skill in reading simple material, this fact is significant. H. W. appears to comprehend but reads slowly. W. J. is grossly lacking in ability to comprehend.

Additional information secured by means of informal tests. In order to secure more detailed information concerning the deficiencies of these students in silent reading certain informal tests were devised. Some of these were administered individually and the investigator had a better opportunity of becoming familiar with the student's mental processes than was possible through standardized

tests alone. The particular purposes to be realized by means of these informal tests are indicated by the captions of the following paragraphs.

1. Procedure in finding information in textbooks. The students were given a copy of a reference book in ancient history and the following questions pertaining to the mechanics of using a book were asked:

1. On what page is the map of Europe in the time of Charlemagne A. D. 814?Tell how you found this map?.....
2. How many chapters are contained in Part IV of the book? How did you find out?.....
3. On what page is a colored plate showing a Corner of the Parthenon?.....Tell how you found this page.....
4. On what page do you find information about Amos the peaceful reformer?Tell how you found this page.....
5. Name another book which the author gives as a reference to be read in connection with Chapter XVII.....Tell how you found it.....
6. Turn to page 590. What does (953) mean?.....
7. Write the paragraph headings on page 157.....

2. Habitual manner of reading. The student was directed to read certain selected passages in history, literature and civics, "just as if they had been assigned by your teacher and you were studying your lesson." The time for such reading was taken and the student was directed to "tell me just what you have been reading" or to answer specific questions based upon the selection read. If errors were made the student was asked to reread the passage for the purpose of identifying his difficulty.

3. Attention to details. The student was asked to read simple material and then to answer questions calling for specific details. For example, one student was given a passage containing the names and descriptions of eight dogs comprising a sledge team. After he completed his reading he was asked to tell the number of dogs, and first answered "four." When asked the question, "Are you sure you are right?", he read again and answered "five." The next inquiry brought the answer "seven." It was only after the fourth reading that he gave the correct number.

4. Vocabulary. The score made on the Holley Sentence Vocabulary Scale is indicative of the size of the reading vocabulary. Additional information was secured by asking these students to give the meaning of phrases and clauses which they encountered in some of the more difficult reading. Attention was given to phrases and clauses rather than to words.

5. **Rate of rapid reading.** The student was directed to "read as rapidly as you can and still be able to tell me what you read," and at the end of one minute was asked to tell in his own words what he had read and sometimes to answer specific questions. A variety of material was used with this direction. The purpose was to determine the maximum rate at which the student was able to read with a satisfactory comprehension.

6. **Following directions.** The information revealed by the Burgess Picture Supplement Scale was supplemented by other tests which involved the following of directions. These tests varied somewhat with the different students.

7. **Eye movements.** Information concerning mechanism of reading was secured by asking each student to read before a mirror placed so that the movements of his eye could be seen by the observer. It was found that the number of fixations per line and the frequency of regressive movements could be determined with sufficient accuracy to indicate whether or not a lack of skillful eye movement existed.

Causes of poor performance in silent reading. Four of the eight subjects were found not to be deficient in the mechanics of reading. Their unsatisfactory performance was due almost wholly to difficulty in comprehension and interpretation. The other four subjects read very slowly, exhibited other evidences of serious defects in the mechanics of reading, and appeared also to be lacking in their ability to understand the material read. In addition to the limitations chargeable to a lack of general capacity to learn, the most obvious causes of failure in silent reading were the following:

1. Inadequate reading vocabulary.
2. Failure to give attention to details of material read.
3. Failure or inability to think independently about what is read.
4. Lack of interest in reading.
5. Lack of skill in recognition of words.
6. Narrow span of recognition.
7. Unsatisfactory eye movements.

Remedial exercises in reading.³ After considering the subjects from two points of view, namely (1) their capacity to do school work and (2) their ability to read silently, it appeared that exercises designed to remedy deficiencies in silent reading would tend to improve their technique of study. For the most part the exercises were the

³Because of the limitations of space only the most significant types of exercises will be described.

same for the eight students although there was some adaptation to specific needs. If the causes of deficiency enumerated in the above paragraph could have been analyzed into more elementary causes it is likely that students who appeared to have the same needs would have been shown to differ in the nature of their deficiencies, and that greater differentiation could have been made in the character of the remedial exercises.

Exercises to increase the rate of reading. In order to increase the rate of reading the subject was given a daily exercise in which he was directed to read for one minute "as fast as you can and still be able to tell me what you have read." In case he failed to give a satisfactory oral reproduction of the material read he was asked to reread the text and make the necessary corrections. The subject was kept informed of his daily score in terms of number of words per minute and was encouraged to compete with his previous record. An attempt was made to keep the material reasonably uniform in difficulty and in the nature of subject-matter.

Exercises to increase span of recognition. Some of the exercises designed to increase the span of recognition were similar to those described in the preceding paragraph, except that very easy material was chosen so that little difficulty in comprehension would be encountered. Most of the selections were taken from supplementary readers for the intermediate grades. Students whose span of recognition was very narrow were given also quick perception drills on sentences of various lengths and degrees of vocabulary difficulty. Each sentence was typed on a separate card and exposed for a very short time. As the subject increased his span of recognition, longer sentences were used. Representative sentences are reproduced below:

The man is very poor.
She lighted another match.
The war began two years ago.
There is a bridge over the river.
Once a fairy lived in a wood.
The house was neat from attic to cellar.
The rolls were covered with a napkin.
Mother is making lemon pies and squash pies.
In my opinion, we should all work for peace.
Do not accuse a person of evil too quickly.

Exercises to enlarge vocabulary.⁴ In the case of those students who had most difficulty with their reading vocabulary, emphasis

⁴Suggestions for these exercises were secured from:

Osburn, W. J. "Graded and diagnostic paragraphs for use in silent reading," Madison, Wisconsin: State Department of Public Instruction, 1922. 6 p.

was placed upon engendering an attitude of watchfulness for those words that were unfamiliar or not clearly understood. When such a word was identified either the student was shown another passage which contained the same word, or the investigator formulated a suitable sentence. If this procedure proved unsuccessful the student was directed to look up the word in the dictionary, select the appropriate meaning, and then use the word in two or three sentences. The original sentence containing the unfamiliar word was copied in a notebook so that a record of new words was kept for each student and used for review. An important phase of this remedial treatment was an endeavor to increase the student's power of deriving word meanings from the context and thus to develop a habit of determining meanings in this way. After reading a selection the student designated the unfamiliar words and occasionally was asked at the end of each line if there had been any words of which he did not know the meaning.

Exercises to engender skillful eye movements. The exercises designed to increase the span of recognition served also to decrease the number of regressive and irregular eye movements. In addition, the subjects were frequently asked to read "just as rapidly as you can" some simple and narrative material. The selections chosen were designed for the third grade and conversational passages tending to introduce a large number of short lines were avoided. As the purpose of these exercises was to encourage rapid reading, the students were not questioned on comprehension.

Exercises to arouse interest. The need for increasing an interest in reading was kept in mind, when possible, in selecting material for all the exercises. Frequently, the students, after reading and discussing a portion of a narrative, desired to complete the story and were encouraged to do so. Attention to details was minimized as much as possible in order to avoid engendering a dislike for the reading of stories. Partly as a result of the training given, one subject read two large books during the ten weeks of observation.

Exercises to correct errors in recognition of words. Although it was not the purpose of this investigation to give training in oral reading it was thought desirable to give some oral exercises in order to correct certain errors in the recognition of words. Occasionally in connection with the silent reading of a passage, a student was asked to pronounce certain words when there was any evidence that they had not been recognized accurately.

It was noted that frequently familiar words such as "prove" for "provide;" "hospitable" for "hospitality;" "through" for "thorough;" "broad" for "board," etc. were miscalled. When a student made this type of error he was asked to pronounce lists of words in addition to reading the oral selections. The mispronounced words were noted, were called to his attention, and were kept on record as a basis for further practice.

It was found that some students failed to identify certain printed words which they were accustomed to use in their conversation, and which when heard afforded them no difficulty of comprehension. For example, when encountering the sentence, "The gnat stung the cattle," "gat" was read for "gnat" although the student was found to be familiar with the sound and meaning of the word "gnat." This type of error might result from a weakness in visual memory, but there was no evidence that this was true, except possibly in the case of one subject.

Exercises to give training in answering questions from memory. Exercises designed to give training in answering questions from memory were compiled. Usually the subjects gave oral replies, although at times they were required to write their answers. The directions given the students after a certain paragraph had been indicated were: "Read as rapidly and as carefully as you can. I want you to read as fast as you can and still be able to answer questions about what you have read." The questions asked called usually for specific facts.

Exercises to give training in finding answers to questions. In exercises designed for the purpose of finding answers, the student was given the questions before he began to read and was then directed to "read and answer these questions. Work as rapidly as you can and be sure to get everything right." The exercises were very similar to those in the Thorndike-McCall Reading Scale and in other silent reading tests of the same type. A few exercises were used in which the student was asked to check from a given list the statement which he considered correct.

A study of the errors made on the Thorndike-McCall Reading Scale indicated that the students were unable to distinguish material which was relevant to a given question from that which was irrelevant. In order to correct this fault, the student was given exercises, illustrations of which are reproduced below, in which he was asked to indicate the best reason for a statement.

Draw a line under the one statement which is the best reason for each of the following sentences:

A nation is great because:

It has great buildings.

It has large armies.

It has many rich people.

The hearts of its people are good, noble and just.

Its people are industrious.

Wheat is an important grain for the farmer because:

It can be easily raised.

It is one of the oldest foods of man.

It is used to make one of the most important foods—bread.

Fields of wheat are beautiful.

Exercises to give training in explaining meanings. In order that the students might receive training in expressing meanings, they were given single sentences at first, and later paragraphs which they were to read and express in their own words. A few representative sentences and paragraphs are reproduced below:

It is certain that the taste of the people of any country is reflected in the literature they prefer.

It seems almost incredible that oil was first regarded as worthless, then sold in small bottles as a medicine, until a process for refining was discovered and the kerosene of commerce made its appearance.

The miner is the one individual who refuses to recognize the impossible. He is always willing to stop anywhere, under any circumstances, to talk about mines, and he is always hopeful, joyous and buoyant. No matter if he never made a dollar from a mine in his life, he is always certain that he will "strike it rich" soon.

The emphatic positions in the sentence, as in the paragraph, are the beginning and the end. The beginning attracts attention first whereas the end gives the final impression. The intervening portions serve to connect, to explain or to limit the important elements, which are emphasized by being placed at the extremes of the sentence. Some elements, it must be observed, would not be emphatic anywhere in the sentence; hence to place them at the beginning or at the end would weaken the thought.

In the West, the Confederates had been forced back everywhere, resisting stubbornly but in vain. The whole southern coast was blockaded by northern fleets. In the East, Lee still kept back the Federal Army and it seemed as far as ever from its goal, Richmond. But every day the Union army grew larger and the Confederate smaller. The North had abundant men and means. Nine-tenths of the southern men were in the army and there were no men at home to replace the killed, wounded and captured. By the end of the year, it was evident that the South was losing ground.

Training in technique of study. In attempting to give specific training in the technique of study, it was recognized that the same methods probably should not be followed for the different subjects of the curriculum. Consequently, in addition to general directions regarding study procedure, tentative sets of directions were prepared for history, algebra, and English literature. These were modified from time to time as the experiment progressed. Each student was given a copy of the directions⁵ and was asked to apply them in the preparation of his assignments and to report upon their use.

⁵The discussion of these directions and the final lists in certain subjects are presented in Chapter IV.

Results of training. Although approximately ten weeks were devoted to this experiment of training in technique of study, no student was able, because of illness, to participate for more than eight weeks. During the first half of the experimental period the emphasis was placed upon the remedial training in silent reading; twenty-five minutes a day, four days a week at first and later two, being devoted to this work. During the latter half of the period, the methods used in the preparation of actual assignments were given special attention. Certain of the students made noticeable progress; one sophomore made his first "A" since entering high school while receiving training in ancient history, a freshman showed a decided gain in work in algebra. Although it is recognized that the improvement noted may not be permanent, it is believed that the majority of these eight students will be more efficient in their school work because of the benefits derived from the specific remedial training received.

CHAPTER III

REPORT OF INDIVIDUAL CASES

In this chapter a detailed report is given for each of the eight students who participated in the investigation. Emphasis is placed upon the causes of unsatisfactory school performance and upon the remedial instruction which was applied.

CASE I. R. R. GRADE X.

School history. R. R. is a young man whose age at the beginning of the investigation was 19 years and 6 months. His previous training had been received in a rural school and in the high school of a small town. After completing the ninth grade and part of the tenth he remained out of school for three years before entering the University High School in September, 1922. In the judgment of his teachers, R. R.'s preparation had been somewhat inadequate for tenth-grade work. One of his teachers made the statement "he has forgotten or never has known a lot of general information which other students have ready for use." At the time of the investigation, R. R. was studying geometry, mechanical drawing, manual training, and English literature. He expressed himself as liking English literature best because "the teacher makes it so interesting." He liked geometry least but was unable to assign a specific reason. During the first semester of the school year, 1922-23, he studied rhetoric and composition, manual training, and geometry, in which he received the grades D, C, and C respectively. His written work was very poor. Frequently he used sentences which were incomplete and which showed that he did not possess a rudimentary knowledge of sentence construction.

Educational plans. R. R. had re-entered high school with the intention of qualifying for entrance in the College of Agriculture at the University of Illinois. He appeared to have settled upon this purpose after mature deliberation and was working about four hours a day in order to defray a part of his expenses.

Disturbing factors. R. R. was not in the best of physical condition and, on account of illness, was absent from school occasionally during the investigation. Because of his outside work he was forced

to study late in the evening, and probably did not have sufficient sleep and exercise. For several years he has been afflicted with a slight deafness which caused him to miss some of the teacher's remarks, and which at times became more acute as a result of frequent colds. He was nervous, self-conscious, rather lacking in self confidence, and hesitated to volunteer a remark in class because he was afraid of being wrong.

Capacity to do school work. According to the scores made on the Otis Group Intelligence Scale, and the Terman Group Test of Mental Ability, R. R. ranked normal in intelligence. However, in both tests his scores fell in the lower half of the normal group. This standing was corroborated by the estimates of his teachers and by the observation of the investigator during the period of training. In addition to possessing low normal general capacity for school work, it appeared that he was rather markedly lacking in ability to do independent thinking.

General procedure of study. R. R. had a fairly regular time and place for the study of each subject and was fortunate in having his physical surroundings comfortable. However, he lived in a rooming house and was frequently interrupted during the evenings by visits from other boys. According to his own statement he experienced considerable difficulty in getting down to study again after an absence of three years from school, and found that his mind was constantly wandering from the lesson he was preparing. Observation of his study in English literature demonstrated that his learning was superficial and that he appeared to be unaware of the fact that he was getting little meaning from the printed page. He did not seem to realize the necessity of getting ideas clearly in mind and apparently made no attempt to evaluate and organize the content of the assignments. His purpose apparently was to remember as far as possible the words of the text. He stated that he ordinarily stopped studying before he felt sure that he had thoroughly mastered his lesson.

Diagnosis of reading ability. On the Monroe Standardized Silent Reading Test III, Form 1, his scores were up to the standard for his grade, and his performance on the Burgess Picture Supplement Scale, Form 1, was considered satisfactory. On the other hand, his performance on the Thorndike-McCall Reading Scale, Form 2, and on the Haggerty Achievement Examination in Reading, Sigma 3 was somewhat below standard. An examination of his errors on these two tests indicated that R. R. was in the habit of giving little

attention to details in reading. This was corroborated by the informal reading test and by the observation of his study. The results of the diagnosis of R. R. 's. ability in silent reading may be summarized as follows:

1. He fails to give sufficient attention to the meaning of the material read.
2. He has a habit of skipping or of otherwise neglecting words or even small groups of words.
3. He fails to think about what he is reading.
4. In spite of the fact that he made a satisfactory score on the Holley Sentence Vocabulary Scale, he was found to be deficient in reading vocabulary.

Remedial training in reading. In applying the remedial instruction described in Chapter II for the purpose of correcting his faults in silent reading, it was found that R. R. greatly reduced his rate of reading, which at the beginning of the investigation had been approximately normal for his grade. In order to correct this tendency he was given exercises to increase his rate of reading. His cooperation was enlisted by pointing out the specific character of his faults and his interest was sustained throughout the investigation.

Result of remedial training in reading. At the end of the experimental period, of which approximately four weeks had been devoted to remedial training in reading, R. R. was again tested in silent reading by Monroe's Standardized Silent Reading Test III, Form 2, Thorndike-McCall Reading Scale, Form 3, and the Burgess Picture Supplement Scale, Form 2. The scores made both at the beginning and at the end of the experimental period are given below:

	<i>Initial Scores</i>	<i>Final Scores</i>	<i>Grade Norms</i>
Monroe Standardized Silent Reading Test* . .			
Rate.....	86	106	90
Comprehension.....	25	32	28
Thorndike-McCall Reading Scale.....	53	55	62.9
Burgess Picture Supplement Scale.....	12	15	13

*Forms 1 and 2 of Monroe's Standardized Silent Reading Test do not yield equivalent scores. It is likely that the duplicate forms of the two other tests also fail to yield equivalent scores. Hence comparisons between initial scores and final scores should be made with caution. The norms for Monroe's Standardized Silent Reading Test given in this and in similar tables are for Form 2.

The results of the tests indicate that R. R. made distinct gains in his ability to read silently. In the case of the Monroe Standardized Silent Reading Test III, his final scores are above the standard for

his grade, whereas his initial scores are slightly below. The investigator believes that the actual improvement in reading ability is greater even than indicated by these tests, and that R. R., because he understands and is interested in overcoming his reading deficiencies, has been given a means for continuing his advancement.

Remedial training in study procedure. At R. R.'s own request, the training in study procedure was given in English literature, his favorite subject. The class during the ten weeks of investigation was studying poems of Wordsworth, Coleridge, Byron, Scott, and Keats. As the pupils were frequently asked to read the poems aloud in class, they received some training in oral reading. In the remedial training given R. R., emphasis was placed upon methods of study that would be effective in securing the meaning of the material read and that would lead to independent thinking about the topic studied.

Results of remedial training in study procedure. At the beginning of the experimental period, R. R.'s work in English Literature was rated as D-; at the close, as C and C-. According to his teacher's statement, he had shown improved ability to get the meaning of the subject-matter, but was still unable to do much independent thinking. "He seems incapable," she said, "of standing on his feet and going far into the realm of ideas." His attitude during the entire ten weeks was very commendable and he made a determined effort to carry out the suggestions for study. The fact that he was able to do better work afforded him much encouragement and increased his desire to perform well the tasks assigned him. This improved attitude toward his school life was one of the most gratifying results of the remedial training.

Summary. As a result of the intensive study made of R. R. the following conclusions were apparent:

1. R. R.'s capacity to do school work, particularly in those subjects which require much abstract thinking, is slightly below the average. These general limitations are accentuated by the difficulty of getting back to study after an absence of three years from school and by a lack of physical well-being.

2. His previous training was received in schools that gave little attention to training pupils in effective methods of study.

3. A haphazard, unmethodical and ineffective study procedure, particularly in silent reading, largely the result of his previous training, was perhaps more responsible than any other single factor for his low school standing at the beginning of the investigation.

4. The remedial training resulted in increased reading ability and in more satisfactory school work in the subject for which specific directions were given. It is, however, not certain that the effect of the short period of training will be permanent. It is the belief of the investigator that if similar training had been given earlier in the school career and had been extended over a longer period, R. R. would have been rated as a good student at the time of this investigation.

CASE II. J. B. GRADE X.

School history. J. B., whose chronological age at the beginning of the investigation was 18 years and 7 months, is a quiet and somewhat shy young man. This is probably emphasized by the fact that he is not fluent in speech and has a slight lisp. His home is in Urbana where he received his elementary education. On account of failure in grammar school he repeated the fifth grade. After completing the eighth grade he left school "because he did not like school" but three years later, September, 1921, he entered the University High School. During the first semester of the school year, 1922-23, he studied English II—language and composition, Spanish I, chemistry I, civics, and geometry I, and made grades of D, D, D, C, and C, respectively. The marks received during the preceding year had been more satisfactory, about half of them being B's.

In addition to his heavy schedule of studies, J. B. was spending two or three hours a day in outside work. His attitude toward school and his relationships with his teachers and fellow-students were excellent in every respect. He had the reputation of being a hard worker and was seldom, if ever, found to be idle. He stated that, after completing high school, he expected to enter the University of Illinois in order to prepare himself as a civil engineer.

Disturbing factors. J. B. was in poor physical condition and was often subject to colds. He was absent frequently from school because of illness, either his own or that of other members of his family.

Capacity to do school work. On the Otis Group Intelligence Test, J. B. made a score which indicated superior general intelligence. Although his performance may have been influenced by the fact that he had taken this test in the autumn of 1921, it is doubtful whether this acquaintance served to increase his score materially. On the Terman Group Test of Mental Ability he attained the standard for the tenth grade and was shown to be only slightly below the normal age of adults. His teachers rated him as normal or above

normal in general intelligence, and stated that he worked slowly but that if given time, he could usually "get" his assignments. His geometry teacher said, "J. B. is slow, but he is one of the most logical thinkers in my class. He is not helpless. He knows just where he is 'stuck' and what he wants to know." J. B.'s performance on the informal tests and his reaction to the remedial training in both silent reading and study procedure indicated that he was accustomed to do independent thinking. An examination of his test papers revealed that very few of his responses were incorrect and that his failure to make higher scores was due to slow rather than to inaccurate work. Thus, it seems clear that J. B. probably possessed a capacity to do school work somewhat above that of the average student in the tenth grade.

Diagnosis of reading ability. J. B.'s scores on the Monroe Standardized Silent Reading Test III showed that he was able to read the simple exercises of this test with reasonable rapidity and with decided accuracy. However, he had taken the test about a year before the beginning of this investigation and his acquaintance with it probably served to increase his scores slightly. On both the Thorndike-McCall Reading Scale and the Haggerty Achievement Examination in Reading, Sigma 3, his scores were much below the standard for his grade. On the Holley Sentence Vocabulary Scale his score was also very low. Thus it appears that J. B. is deficient in ability to read other than very simple material.

A further investigation into J. B.'s reading ability by means of the informal tests indicated that he usually read slowly and was inaccurate in his recognition of many common words. For example, when reading orally he called "serve," "severe"; "through," "thought"; "though," "thought"; "aboard," "abroad." He was unable to pronounce a large number of words even when he was familiar with the meaning. However he was apparently successful in comprehending a paragraph when he was able to associate correct meanings with the words. J. B. was aware of his deficiency in reading although he did not understand the exact cause of it.

Diagnosis of study procedure. J. B. reported that he did practically all of his studying at home, beginning as soon as the evening meal was over and continuing until eleven or twelve o'clock. He was accustomed to study in the living room, surrounded by other members of the family, and frequently stopped to enter into conversation for a short time. He appeared to be somewhat unsystematic in his

procedure and reported difficulty in concentrating his attention upon his work. When questioned concerning the evaluation of items in an assignment and the selection of those of major importance, he stated that in chemistry and geometry, he usually stressed significant topics but that in the other subjects all of the material seemed equally important. Unless handicapped for time, he continued his study of a lesson until he completed it satisfactorily.

Remedial training in reading. J. B. was given about four weeks of training in silent reading, although there were frequent interruptions due to absence from school. Emphasis was placed upon increasing his ability to recognize words correctly and his rate of reading. An attempt was made to give J. B. an understanding of the nature of his deficiencies, and he was urged to read orally and to apply rules for pronunciation, syllabication and phonics.

Results of remedial training in reading. At the end of the training period J. B. was again tested in silent reading by Monroe's Standardized Silent Reading Test III, Form 2, Thorndike-McCall Reading Scale, Form 3, and the Burgess Picture Supplement Scale, Form 2. The results of this testing, together with the initial scores are given below:

	<i>Initial Scores</i>	<i>Final Scores</i>	<i>Grade Norms</i>
Monroe Standardized Silent Reading Test*			
Rate.....	86	89	92
Comprehension.....	40	38	29.4
Thorndike-McCall Reading Scale.....	51	60	62.9
Burgess Picture Supplement Scale.....	7	11	13

*See footnote to similar table, p. 23.

The gains made in the scores on the Thorndike-McCall Reading Scale and the Burgess Picture Supplement Scale indicate that J. B. made material progress in correcting the deficiencies revealed by the diagnosis of reading ability.

Remedial training in study procedure. As the student expressed no choice with reference to the subject in which remedial training in study procedure should be given, the investigator chose English II—language and composition. Because of J. B.'s frequent absences from school, the training, although distributed over a much longer period, amounted to only three weeks and was probably less effective because of the interruptions.

Results of remedial training in study procedure. J. B.'s school work was uniformly better at the end of the period of training than it had been during the first semester. This improvement, however,

may have been due to increased ability in silent reading and to more diligent application to school work as well as to the specific training in study procedure.

Summary. The following conclusions in regard to J. B. seem justifiable:

1. J. B.'s unsatisfactory school work does not appear to be due to a lack of general intelligence, as in this respect, he is probably above the average.

2. The outstanding cause for his poor standing in school is his difficulty in reading which in turn is due to incorrect recognition of words and to the lack of an adequate reading vocabulary.

3. The above cause is supplemented by poor health, irregular attendance at school, a heavy schedule and outside work.

4. Remedial instruction in reading resulted in a marked increase in reading ability as measured by the Thorndike-McCall Reading Scale and the Burgess Picture Supplement Scale.

CASE III. L. W. GRADE XII.

School history. L. W.'s age at the beginning of the investigation was 19 years and 4 months. He entered the eleventh grade of the University High School in the fall of 1921, having received two years of secondary training in another school. In elementary school, although his instruction had been of a rather high quality, he had repeated one or two grades; and in high school his record had been distinctly unsatisfactory. During his first year in the University High School he failed in two courses, and received a condition in one course at the close of the first semester of the school year 1922-23. Although L. W. stated that he wished to enter the University of Illinois and study commerce it appeared doubtful whether this desire was sufficiently definite to exert much influence upon his efforts to learn. He appeared somewhat indifferent to his low standing, and his teachers expressed the opinion that he failed to apply himself and that he frequently attempted to bluff in class work by talking around a topic when he had no ideas to present.

Disturbing factors. L. W. was frequently absent from school, occasionally on account of illness, but usually for causes which were more or less trivial. He smoked a great deal and his apparent listlessness and lack of energy were due, in the opinion of some of his teachers, to the enervating effects of this habit.

Capacity to do school work. In the tests measuring capacity to do school work, the performances of L. W. were inconsistent. He made a low score on the Terman Group Test of Mental Ability and was average or above on the Otis Group Intelligence Scale. In view of the reports of his teachers and of the other information secured, it appeared that L. W. was not mentally below normal general intelligence and that if he made the effort he could do much better school work.

Diagnosis of reading ability. All of L. W.'s scores on the reading tests were below standard. Both the formal and informal tests indicated a lack of comprehension and a slow rate of reading. An examination of his eye movements revealed a very narrow span of recognition as well as many regressive movements. He appeared also to be somewhat deficient in vocabulary.

Diagnosis of study procedure. L. W. stated that he was accustomed to spend about two hours each evening in the preparation of his lessons, but that he had no regular schedule or system. He studied in the living room surrounded by other members of his family, but stopped frequently to do other things and found it somewhat difficult to keep his mind upon his work. Observation during the period of remedial training indicated that his procedure was haphazard and his study superficial. He did not appear to recognize that his method was ineffective nor to make any special attempt to improve his procedure. Although he was accustomed to underline sentences that seemed important he seldom selected the principal points in the paragraph.

Remedial training in reading. The remedial training extended over a period of nearly five weeks, but was frequently interrupted by L. W.'s absences from school. He was given, in addition to the exercises for increasing rate of reading, exercises designed especially to increase his span of recognition, to eliminate regressive eye movements and to increase his attention to details.

Results of remedial training in reading. The scores given below show that, with the exception of the comprehension score on the Monroe Standardized Silent Reading Test III, L. W. made a commendable improvement in the phases of reading measured by the tests. In view of his second comprehension score, the one made on the first trial was probably an inaccurate measure of his ability. It should be noted that he made progress in spite of the fact that he had shown no interest in the training designed for his improvement.

	<i>Initial Scores</i>	<i>Final Scores</i>	<i>Grade Norms</i>
Monroe Standardized Silent Reading Test*			
Rate.....	77	89	104
Comprehension.....	28	15	33.1
Thorndike-McCall Reading Scale.....	49	54	66.8
Burgess Picture Supplement Scale.....	5	8	15

*See footnote to similar table on p. 23.

Remedial training in study procedure. The remedial training in study procedure was unsatisfactory. Because of L. W.'s indifference, amounting almost to antagonism, and because of his slow rate of reading it was not possible to carry out the training which was followed in the case of the other students. His responses to suggestions were very perfunctory. Furthermore his frequent absences greatly reduced the number of experimental periods. His teachers were not able to report any improvement in his school work.

Summary. The following statements were made in regard to the work with L. W.:

1. L. W.'s low standing cannot be explained by a lack of capacity to do school work.

2. Irregular attendance, indifference, lack of ability to read, and superficial and haphazard study procedure are the most potent causes of L. W.'s failure to do satisfactory school work.

3. Although given under unfavorable conditions, the remedial training increased L. W.'s ability to read silently. There was no marked improvement in his school work, but it is likely that this was due to his irregular attendance and to his attitude of indifference.

CASE IV. H. W. GRADE X.

School history. H. W., whose age at the beginning of the investigation was 18 years and 6 months, had received her elementary training in a small rural school. The first year of her high-school work was done at the University High School and, according to the testimony of her teachers, her preparation was not noticeably inadequate. With the exception of one absence when in the seventh grade, she had never been away from school for any extended period, and she had never failed of promotion. During her first year in high school she registered in four courses and received a grade of D in all of them except sewing, in which her standing was C. At the time of the investigation she was enrolled in ancient history, geometry I, French I and English II. During the first semester she had taken

the same subjects. Her grades at the end of the semester were D, D, E, and D. Her teachers reported that H. W. tried hard and seemed conscientious in performing the tasks assigned to her. She had employed a tutor in French in which she had failed during the first semester.

Disturbing factors. Several years ago H. W. was injured by a fall from her pony and has been afflicted ever since with nervousness. A few months prior to this investigation she suffered a nervous breakdown, and still found it difficult to keep her hands still or her face from twitching almost constantly. Her geometry teacher made this remark, "H. W. cannot hold a compass or protractor steady enough to do accurate construction work, so in the laboratory work, where poor students often do well, H. W. is as poor as in formal geometry." During the investigation she was frequently absent from school on account of illness.

Capacity to do school work. H. W.'s performance on the group intelligence tests indicated a mental age of about 14 years. However, her teachers expressed the opinion that her capacity to do school work was somewhat higher than represented by such a mental age, and that probably her standing on the group test was lowered because of her physical condition and because of the fact that under strange conditions she seldom seemed able to do herself justice. Her performance on the informal tests, after she became acquainted with the investigator, tended to corroborate this opinion of her teachers. Therefore, it is believed that H. W. should be classified as possessing normal mental capacity to do school work.

Diagnosis of reading ability. The standardized silent reading tests did not reveal significant deficiencies in silent reading, but H. W.'s performance on the informal silent reading tests tended to show a lack of attention to details. She appeared to be inclined to read rapidly¹, but in case the material was at all difficult her comprehension was very poor.

Diagnosis of study procedure. H. W.'s general procedure for studying her lessons was good. She seemed to be subjected to few, if any, disturbances and had a fairly regular routine. Although insisting that she seldom stopped her studying to do other things, she

¹H. W.'s poor rate score on the Monroe Standardized Silent Reading Test III contradicts this conclusion, but this score was found to be in disagreement with her performance on all other reading tests. It is thought that the strangeness of the test caused her to work much more slowly than normal.

admitted that she had difficulty in concentrating her attention on certain school subjects. She showed some ability to think independently about her lessons and attempted to pick out the more important statements in an assignment. She failed, however, to get the meaning of what she read, or to review topics and organize information effectively.

Remedial training in reading. In the remedial training in reading, emphasis was placed on comprehension. Although the tests used do not measure adequately the particular ability which the remedial training was intended to engender, the scores indicate that the training was effective.

	<i>Initial Scores</i>	<i>Final Scores</i>	<i>Grade Norms</i>
Monroe Standardized Silent Reading Test*			
Rate.....	77	122	92
Comprehension.....	28	34	29.4
Thorndike-McCall Reading Scale†.....
Burgess Picture Supplement Scale.....	15	16	13

*See footnote to similar table on p. 23.
 †The Thorndike-McCall Reading Scale was not given to this student.

Remedial training in study procedure. At H. W.'s request, remedial training in study procedure was based on the assignments in ancient history. Her attention was called to her deficiencies in study procedure and instruction was given in reviewing and summarizing. H. W.'s attitude toward the remedial training was excellent and she attempted to carry out the suggestions to the best of her ability. Near the close of the training period she received a grade of A, the first during her high-school career. As her standing at the beginning of the experimental period was approximately D, this represents a very marked improvement. Although the training which she received both in reading and in the technique of study doubtless was a potent factor in bringing about this improvement, the zeal and interest which H. W. came to exhibit in her work also contributed to her success.

Summary. The following conclusions are made in regard to H. W.:

1. H. W. is probably not lacking in capacity to do school work.
2. Her physical condition is a handicap, but should not be considered the only cause of her unsatisfactory work.
3. Among the most important deficiencies in her study procedure are failure to comprehend difficult material, lack of attention to details and inability to summarize and organize her material.

4. The remedial training was unusually successful in increasing H. W.'s standing in ancient history.

CASE V. T. H. GRADE IX.

School history. At the beginning of the investigation T. H. was 14 years of age. In the judgment of his teachers his preparation for high-school work was inadequate, and it was found that most of his elementary-school training had been received in schools of rather low standing. He was enrolled in algebra, English, manual training, and Latin I, and received semester grades of D, D, D, and E, respectively. He stated that he liked algebra better than any other subject studied, but that he disliked Latin very much, "because he could not see anything to it." T. H. is large, clumsy, apparently rather lazy, and, in the judgment of his teachers, not interested in his school work nor inclined to make much effort to study his lessons.

Disturbing factors. Disturbing factors such as those which have been prominent with the other subjects did not appear to apply to T. H. His attendance was regular, and his health excellent. He was not up late at night nor did his home life seem to interfere with effective study.

Capacity to do school work. The scores which T. H. made on the group intelligence tests, and the other information which was secured, indicate that he should be classed as having very low normal capacity to do school work. It was reported, however, that occasionally, especially in mathematics, he gave evidence of a much higher capacity.

Diagnosis of reading ability. The standardized tests showed that T. H. was deficient in ability to read silently. His most significant weaknesses appeared to be a narrow span of recognition, regressive and irregular eye movements, inaccurate recognition of words, limited reading vocabulary, and failure or inability to think about what he had read.

Diagnosis of study procedure. T. H.'s deficiencies in reading were so marked that effective study was not possible. However, even if he had possessed satisfactory reading ability, he probably would not have been efficient as a student, because he had no regular time nor place for the study of his lessons and was accustomed to follow a very haphazard procedure.

Remedial training in reading. Remedial training in reading was continued for approximately five weeks. Special emphasis was

placed upon increasing the span of recognition, eliminating regressive eye movements and increasing meaning vocabulary. T. H.'s errors were pointed out to him and an effort was made to enlist his cooperation in eliminating them. He showed some interest in reading simple books of travel and adventure and there seemed a noticeable increase in his ability to read this type of material. The repetition of the tests at the end of the training period showed commendable gains but his reading ability was still below that required for effective study.

	<i>Initial Scores</i>	<i>Final Scores</i>	<i>Grade Norms</i>
Monroe Standardized Silent Reading Test*			
Rate.....	77	106	86
Comprehension.....	12	16	26.6
Thorndike-McCall Reading Scale.....	45	54	61.5
Burgess Picture Supplement Scale.....	6	8	12

*See footnote to similar table on p. 23.

Remedial training in study procedure. T. H. expressed no preference as to the subject in which the remedial training in study procedure should be given, and English was selected by the investigator. This training, largely because of his inability to read, was not considered satisfactory. Furthermore, T. H. was not interested and seemed to resent being asked to devote four periods a week to this work. It, therefore, was not surprising that his teacher was unable to report any improvement in the class work.

Summary. The results of the experimental training with T. H. may be briefly stated:

1. The most potent cause of T. H.'s low standing in his studies probably was his lack of interest. However, his capacity to do school work was considered slightly below normal.

2. T. H. was very deficient in silent reading.

3. The remedial training in his case was less effective than in that of the other subjects. This was due largely, it is believed, to his attitude of indifference and even of antagonism.

CASE VI. M. F. GRADE IX.

School history. At the beginning of this investigation M. F.'s chronological age was 13 years and 7 months. She had skipped the sixth grade and was considered adequately prepared for high-school work. She was studying English I, Latin I, algebra I, and musical appreciation, and had made grades of D in each subject at the end of the first semester. Her attitude toward school work appeared to

be one of indifference as she displayed no feeling of responsibility with reference to assignments or to other requests made by her teachers. She was sometimes guilty of bluffing and did not appear to be greatly concerned about her standing.

Disturbing factors. M. F.'s health has been excellent and her home conditions could have been conducive toward study. However, she is an only child of indulgent parents, is permitted to attend movies frequently, and apparently is not being urged by her parents in any way to give more time to the preparation of her lessons.

Capacity to do school work. Although the evidence gathered with reference to M. F.'s capacity to do school work was not entirely consistent, it appeared that she should be considered above normal. There was no indication that she possessed superior intelligence, but on the other hand, there certainly was no evidence that her unsatisfactory school work was due to lack of capacity to learn.

Diagnosis of reading ability. M. F. was found to read rapidly enough but was poor in comprehension. The causes for this condition appeared to be failure to give attention to the material, particularly the details, and to think intelligently about what had been read. This conclusion is substantiated by the fact that her score on the Holley Sentence Vocabulary Test was slightly above the norm for that grade.

Diagnosis of study procedure. M. F. appeared to have no regular time and place for the study of her lessons. She admitted that she experienced difficulty in keeping her mind from wandering during recitation, but insisted that this was not the case when she was studying. In algebra, which was the subject selected for remedial training, she seldom made any attempt to understand the illustrative exercises given in the text but depended entirely upon the teacher's explanations in class. In doing exercises she appeared to manipulate the symbols somewhat at random in an attempt to secure a satisfactory result. She admitted that she usually stopped studying before she felt that she had learned her lesson.

Remedial training in reading. M. F. was somewhat indifferent toward the remedial training both in reading and in study procedure and was absent frequently because of forgotten appointments, or of other school activities. The remedial training in reading was directed toward the elimination of the deficiencies in comprehension, but, as it was found that the rate of reading was being reduced, some train-

ing in rapid reading was added. M. F. became somewhat interested in this instruction and made an effort to improve her daily record. When the silent reading tests were repeated at the end of the experimental period she had made very satisfactory progress in comprehension.

	<i>Initial Scores</i>	<i>Final Scores</i>	<i>Grade Norms</i>
Monroe Standardized Silent Reading Test*			
Rate.....	86	89	86
Comprehension.....	19	26	26.6
Thorndike-McCall Reading Scale.....	47	63	61.5
Burgess Picture Supplement Scale.....	10	...	12

*See footnote to similar table, p. 23.

Remedial training in study procedure. Approximately four weeks were devoted with M. F. to remedial training in study procedure in algebra. At the end of this period her work was of B grade but her performance was still somewhat erratic. Her teacher stated that she was gaining in a sense of responsibility toward her assignments and that failures due to carelessness and indifference were becoming fewer. It should be noted, however, that the improvement exhibited by M. F. was not due wholly to an improved technique of study, for one of the chief causes of her poor standing, as pointed out in the beginning, was lack of application. In the course of the training she began to take an interest in her school work and appeared to be making a much greater effort to prepare her lessons.

Summary. As a result of the study made of M. F. the following conclusions are apparent:

1. In the case of M. F., unsatisfactory school work was not due to lack of capacity to learn.

2. Although M. F.'s attitude toward school work at the beginning of the investigation was one of indifference, and she made little effort to prepare her lessons, she was handicapped by a lack of ability to read comprehensively and by a haphazard procedure of study.

3. By the end of the training period, M. F. had raised her standing in algebra from D to B. This, however, was due in part to her changed attitude, which was probably an indirect result of the training.

CASE VII. M. W. GRADE IX.

School history. M. W., who at the beginning of the investigation was 16 years and 10 months of age, received her early elementary schooling in a small village where the quality of instruction probably

was not very good. Beginning with the sixth grade, however, she attended a school which had a fairly high standing. She failed of promotion in the third and in the sixth grades, but in the latter case the non-promotion was due largely to absence from school for several months on account of illness. During the first semester of the year 1922-23, M. W. was enrolled in English I, algebra I, French I, and cooking. She received grades of C, D, E, and D, respectively, in these subjects. According to the testimonies of her teachers, M. W. applies herself diligently. After graduating from high school she expects to enter the University of Illinois for the purpose of specializing in Home Economics.

Disturbing factors. M. W. is in excellent health and has not been absent since entering school in September. She resides with an aunt, her mother having died when she was very young, and her home conditions are not such as to interfere with school work. She appears to be self-conscious, rather timid about reciting in class, and becomes easily discouraged.

Capacity to do school work. The group intelligence tests indicated a mental age of between 13 and 14 years. On the basis of this and of other information, the investigator believes that, although she is near the border line between the inferior and normal groups, she should be reported as inferior in capacity to learn. A marked deficiency in ability to remember ideas is indicated both by the tests and by certain difficulties in studying algebra.

Diagnosis of reading ability. All of M. W.'s scores on the standardized silent reading tests show her as below the norms for the ninth grade. On the Burgess Picture Supplement Scale her standing approximated the norm for the fourth grade. Although her scores on the Holley Sentence Vocabulary Scale were slightly above the standard for the ninth grade, the informal tests revealed that she possessed a very limited reading vocabulary. In addition to being deficient in her vocabulary, M. W. failed to give attention to the content of material read and to details. She also made many errors in answering thought questions based upon the reading selections.

Diagnosis of study procedure. Although M. W. was accustomed to study in the living room surrounded by other members of her family, it did not appear that this constituted a serious disturbing factor. She admitted that she had no regular schedule for studying the different subjects and would drop one lesson after a little time and

take up another. One of her teachers remarked that, "her study habits were merely consistent with her personal habits." M. W. was described as flighty in her interests and in her ability to center her attention on one point. She appeared to have great difficulty in remembering facts and in applying abstract ideas. In her work in algebra, her procedure, which consisted largely of trying various manipulations of symbols in the hope that a satisfactory answer would in some way be secured, gave special evidence of this difficulty.

Remedial training in reading. The remedial training in silent reading extended over a period of five weeks with very few absences. Exercises, in addition to those designed to correct the deficiencies enumerated, were given in order to counteract the lowering of rate of reading which resulted from the emphasis placed upon defects in comprehension. Previous to the remedial training, M. W. had cared little for reading but during the experimental period her interest was aroused and she read two books recommended by the investigator. She seemed very much interested in improving her ability to read and made a determined effort to correct the defects pointed out to her. When the silent reading tests were repeated at the close of the training period the scores indicated that she had made very commendable progress, due in part doubtless to the effort and enthusiasm which she put into her work. It should be noted also that the training period was slightly longer in her case than in that of the other subjects.

	<i>Initial Scores</i>	<i>Final Scores</i>	<i>Grade Norms</i>
Monroe Standardized Silent Reading Test*			
Rate.....	77	122	86
Comprehension.....	17	32	26.6
Thorndike-McCall Reading Scale.....	49	60	61.5
Burgess Picture Supplement Scale.....	7	13	12

*See footnote to similar table on p. 23.

Remedial training in study procedure. M. W.'s deficiencies in the fundamentals of algebra were so great that it was not possible to give much attention to the technique of study. A large portion of each training period was spent in reviewing previous work and in looking up formulas and other items of information. She seemed also to be handicapped by a special deficiency in grasping abstract ideas. In spite of the fact that she was interested and made a conscientious effort to improve, it is doubtful, in the opinion of the investigator,

that she received any direct benefit in her work in algebra from the training given.

Summary. The following statements in regard to the work with M. W. seem justified:

1. M. W. was found to be deficient in capacity to do school work, particularly in applying abstract ideas in such a field as algebra. She is probably not deficient to the extent that success in certain other school subjects is impossible.

2. M. W. was found to be conspicuously deficient in ability to read silently.

3. The deficiencies in capacity to learn and in ability to read silently were supplemented by the lack of an efficient study procedure.

4. M. W. responded to the remedial training in reading in a very satisfactory way. In addition to increasing her scores on standardized tests she developed an interest in reading.

5. The remedial training in algebra was only slightly, if at all, effective. This was due to the lack of prerequisite information and to an apparent deficiency in capacity to learn algebra.

CASE VIII. W. J. GRADE IX.

Introductory statement. As W. J. was very frequently absent from school during the last weeks of the experimental period, the remedial training in study procedure was not completed and the silent-reading tests were not given a second time. Thus, the report in his case is decidedly incomplete.

School history. At the beginning of the investigation, W. J. was 16 years and 6 months of age. He had repeated the first and eighth grades in elementary school and was considered by his teachers very inadequately prepared for high-school work. These failures probably were due to his lack of effort and of capacity to learn rather than to the quality of instruction which he had received. During the first semester in high school he studied English I, Latin I, manual training, and algebra I, failing in all of these subjects. He seemed to lack ambition and a definite purpose, made little effort to study, and apparently was attending school chiefly as a result of parental compulsion. One of his teachers stated, "W. J. is listless and uninterested in general. If a thing is not easy to do he doesn't do it."

Capacity to learn. According to the group intelligence tests W. J.'s mental age was only slightly above 12 years. This is corroborated by the opinion of his teachers and by the additional information secured.

Diagnosis of reading ability. W. J. was found to be very deficient in reading. His comprehension score on the Monroe Standardized Silent Reading Test was zero, and his scores on many of the other tests were not above the standard for the sixth grade. His eye movements were irregular and regressive, he had a very narrow span of recognition, and was deficient in vocabulary.

Diagnosis of study procedure. In practically all phases of study procedure, W. J. was found deficient. He studied in the living room surrounded by other members of his family and was accustomed to stop occasionally to engage in the conversation. He had no regular hour in which he prepared his lessons and confessed that he usually studied one for a time and then took up another, returning later to the first one. He apparently made no attempt to select the important points in an assignment and passed over anything that he did not understand, expecting that it would be explained by his teacher in class.

Summary. The following brief summary is made concerning the work of W. J.

The most fundamental cause for W. J.'s unsatisfactory school work is lack of capacity to learn. This is supplemented by a lack of interest and by other deficiencies due probably to his subnormal mentality.

CHAPTER IV

DIRECTIONS USED IN REMEDIAL TRAINING IN STUDY PROCEDURE

Teacher activity versus student activity. In the preparation of the directions used in the remedial training in study procedure, a distinction was made between the activity of the teacher and that of the learner. A student is educated only by his mental and physical activities. What the teacher does can affect the outcome of the educative process only indirectly through stimulating and guiding the learning activities of the student.

The directions recorded in this chapter, were designed to describe general procedures, some of which are essential, others contributory to effective study. However, it should be recognized that study, except in the case of acquiring motor control and memorizing, cannot be reduced to a mechanical procedure and success will depend in part upon the ingenuity of the learner in meeting new and unusual situations. The learner, however, may build for future success by adopting those general procedures which tend to promote successful learning. When difficulties are encountered, the teacher can be of assistance by giving appropriate suggestions and by stimulating the learner to make further efforts.

Sources of directions for study. The directions for study listed in the following pages were derived from four sources:

1. An examination was made of much of the voluminous literature relating to the learning process, and special attention given to all material dealing with supervised study and methods of teaching the high-school subjects with which we were concerned.

2. The teachers and supervisors of the various subjects in the University High School were consulted.

3. Several students in the University High School, who were recognized as being conspicuously successful in their school work, were interviewed in regard to the procedures they were accustomed to follow in their studying.

4. In the case of algebra and history, additional help was obtained by means of a questionnaire addressed to the teachers of these subjects in high schools of Illinois.

The directions are not the result of any statistical inquiry into these sources, nor have they been scientifically evaluated. They merely represent the judgment of the writers after utilizing the sources enumerated above.

Differentiation in directions corresponding to differences in subject-matter. A few general directions were formulated which appear to apply to all the high-school subjects dealt with in this investigation. As differences in the learning process involved in the several subjects are sufficiently marked so that many directions useful in studying one subject do not apply to another, specific directions were prepared also for each subject.

GENERAL DIRECTIONS FOR STUDY¹

Introductory statement. Successful study is difficult in a room which is not warm, well-lighted, well-ventilated and otherwise physically comfortable. Successful study is also difficult in a room where there are other persons, or where there are disturbing noises or objects. Thus, the first step is to provide a physical environment which will not interfere with effective study.

1. Make out a daily schedule in which you assign a regular time and place for the study of each subject.

2. Plan to study an assignment as soon as possible after it is made, then review the lesson briefly just before going to class. Do not wait to study a lesson until just before class, because you will have difficulty later in remembering what you study.

3. Before you start studying a lesson collect all of the texts, reference books and other material which you will need so that your work will not be interrupted.

4. Begin working as soon as you sit down, with the determination that you will keep your mind on your lesson, that you will study for all you are worth, and that you will complete your task as quickly as possible.

5. Begin studying with a rush. Do not waste any time getting started.

6. Begin your studying by recalling the main points of the previous lesson and then get clearly in mind the assignment which you are to study.

¹These general directions, as well as those for particular subjects, are reproduced, except for slight editorial changes, in substantially the same form in which they were used in the investigation. No attempt was made to revise them in the light of the results of the investigation.

7. At the end of your study of a lesson, summarize briefly what you have learned. In this summary the most important points should be clearly stated. Usually this summary should be written.

8. Watch carefully for items which you are unable to understand and check them for the purpose of asking your teacher for an explanation. Also make a point of asking your teacher for any additional information which would be helpful to you with your lesson. Plan to ask your teacher at least one good question on each lesson.

9. Keep studying until you are certain you have your lesson or know just what your difficulty is.

SUPPLEMENTARY DIRECTIONS FOR THE STUDY OF HISTORY

Introductory statement. Successful study of history is dependent upon one's ability to read silently. Frequently, progress in developing a good technique for studying this subject will be limited until the teacher has succeeded in training the student to be a more fluent reader. Therefore, for some students the first training will be in silent reading rather than in study procedure.

The teacher should show the students how to select the important points of each paragraph. If students are unable to do this satisfactorily it may be wise to have them prepare written lists of the important items. The teacher may even require students to read a paragraph silently in class and then give the significant points, or to tell in what way the topic stated at the beginning of the paragraph is explained. In case an incorrect answer is given the students should be directed to consult their books and seek the right answer.

The teacher may show how he himself studies, or ask some of the students who do excellent work to tell how they study. Students who find it difficult to keep their minds upon their lessons may be helped frequently if they will read aloud for a time when they notice that their attention is not centered on the assignment.

Underlining is a useful device in the study of history, but the teacher should carefully instruct the students concerning its use.

1. Before beginning the reading of the lesson in history, be certain that you understand the assignment. It should give you a definite purpose for your reading, that is, you should understand what information you are to find and what use you are to make of it.

2. First, read over the entire assignment rapidly in order to get the general trend of thought and the main ideas. Give attention to the paragraph headings and the marginal summaries.

3. Next, read over your lesson a paragraph at a time. Read it carefully. Look up the meanings of unfamiliar words. Locate places mentioned on the map. Read paragraphs and sections to which cross references are made.

4. Underline the important sentences. However, you should be certain that the sentence is important before you underline it.

5. As you study, keep the aim of your assignment constantly before you.

6. Try to determine the reason for the statements which the author makes.

7. Study each paragraph until you are able to give the main points without looking at your book. Commit to memory important names, dates, and definitions.

8. When you have finished an assignment, review it in your mind and summarize it by recalling the most important points. If your lesson consists of several divisions do this for each division.

9. Spend at least as much time in thinking about your lesson as in reading about it.

10. Formulate questions which, in answering, will require an understanding of the most important ideas in your lesson.

11. Try to answer the following questions:

1. What is the relation of today's lesson to the general topic you are studying and what does it contribute to this topic?

2. What is the relation of the general topic to the school subject?

12. When you have finished studying a chapter prepare an outline of it. If you do not understand how to begin such a task, ask your teacher to help you.

SUPPLEMENTARY DIRECTIONS FOR THE STUDY OF ALGEBRA

1. As a preparatory step, get the assignment clearly in mind, recall the teacher's explanation and study again the sample exercises and the explanations given in your text-book.

2. Read your exercises carefully. Be certain with each exercise that you understand what is given and what is to be done, and that you keep these facts clearly in mind while working. Make sure that you copy the exercise correctly on your paper.

3. Take plenty of time to think. Do not begin work until you understand exactly what is given and what is to be done.

4. If you do not know how to begin, consult your textbook and try to recall explanations which your teacher has given.

5. An exercise is frequently made up of a series of steps—do one step at a time.

6. Compare exercises in algebra with the same type of exercises in arithmetic. Frequently this will give you a suggestion.

7. Work carefully. It is easier to avoid mistakes than to find them after they are made.

8. Remember that every symbol in algebra has a very definite meaning.

9. When you are unable to work an exercise do not give up, at least try to find out just what your difficulty is.

10. When it is possible to do so, be sure to check the answers which you obtain.

11. Memorize important rules and formulas, but be certain that you understand them.

12. Use rules and formulas as soon as possible after you have learned them in order that you may fix them in your mind.

SUPPLEMENTARY DIRECTIONS FOR THE STUDY OF ENGLISH LITERATURE—POETRY

1. Think over the title of the poem you are to study and try to form some opinion as to what the poem will be about.

2. Read the entire poem through rapidly to get the general trend of thought.

3. Next, read the poem more carefully, probably a stanza at a time in order to obtain its full meaning. Frequently reading aloud will assist in understanding the poem as well as in appreciating it.

4. Look up and read the notes given in your text.

5. Unless you are certain that you do not need further assistance in understanding the meaning, try to find information about the names and historical places mentioned in the poem.

6. Look up the meaning of unfamiliar words.

7. If there are difficult points, make a note of them so that you may ask your teacher about them in class. Try to ask your teacher one good question each day.

8. Write out a sentence which will express the central thought or theme of the poem.

9. Pick out and make note of the most important characteristics of the poem.

10. Think over your own experiences in order to discover possible illustrations of the poem.

11. Decide whether you agree with everything the poet says.

12. At the end of your study summarize your lesson by recalling the most important points of the poem.

SUPPLEMENTARY DIRECTIONS FOR THE STUDY OF ENGLISH LITERATURE—PROSE

1. Think over the title of your assignment and decide what it will be about.

2. First read the entire lesson through and get the general trend and the main ideas.

3. Next, read it through more carefully, trying to understand everything the author says.

4. Look up, and read the notes given in your book.

5. In case you do not derive a satisfactory meaning from the context, look up the meaning of the words which you do not know.

6. Look up information in regard to places and historical names if such occur in your lesson.

7. Pick out the important *ideas* in your assignment. Indicating them by an underline is a good way but you should make certain that the words selected express the important idea before you underline them.

8. Write out in a sentence or two the central thought of your lesson.

9. Decide whether you agree with the statements which the author makes.

10. At the end of your study summarize the lesson. Be sure to include in this summary all of the important points.

Note.—Supplementary directions for the study of language and composition were prepared also, but they related to an unusual course of study and a unique plan of instruction. For that reason they are not reproduced here.

CHAPTER V

HOW BRIGHT CHILDREN STUDY

Study procedure used by bright children an additional source of data. Additional evidence of the bearing of study procedure upon success in school work may be secured by inquiring into the ways in which the more gifted children go about studying their lessons. Naturally we expect to find that those students who have a noticeably high standing employ highly efficient methods of study, but we must keep in mind also that the success of such pupils probably depends in part upon other factors including their own capacity to learn.

Procedure followed in interviewing bright students. Several teachers in the University High School were requested to select the two or three students whom they considered the best in their classes. The investigator then arranged for an interview with each of these students, some of whom were informed before hand that they were to be consulted concerning their methods of preparing their assignments. The interview was begun by inquiring with reference to a particular subject, "Tell me just what you do when you study your lesson." Unless the student voluntarily covered the points in his answer, follow-up questions were asked such as: "At what time do you usually study your lesson? Do you study it at home or at school? In case you study at home, where do you study? Do you have a hard time keeping your mind on your lesson? How often do you review? What do you do when you come to something you do not understand?" In addition a few questions relating to the particular subject were asked. For example, in history the student was asked if he used a dictionary in the preparation of his lesson, which dates, if any, he memorized, what use he made of the maps and whether he was accustomed to make an outline.

Accounts of five of the interviews are reproduced here because of the significance of the study procedures which are described. These five students, with one exception, came from homes of members of the faculty of the University of Illinois, and doubtless had surroundings conducive to the formation of good study habits. Their home influences were stimulating; they were, as the intelligence

tests¹ showed, children of superior mental ability, and although we should expect such students to make exceptionally high records in their school work, the results of the interviews seem to show conclusively that their success was due in part to the fact that they used efficient methods in studying their lessons.

Second year history—ancient history. N. W. was a sophomore, almost fourteen years of age, who was considered undoubtedly one of the brightest students in the school. His score of 216 upon the Otis Group Intelligence Scale placed him in the rank of superior adults. He began school at the age of five years, had maintained a high standing throughout his entire career, was quiet, conscientious, studious, and little inclined to participate in outside activities. Before coming to the interview he was told its purpose, and made an effort to get in mind just what procedure of study he followed. This he was able to give in a very clear concise manner.

In the preparation of an assignment in ancient history, he reads the entire lesson over once in order to get the general trend of thought. He then reads it carefully a second time to get the meaning in greater detail. The next step is reading paragraph and sectional headings and thinking over the material they represent as a means of testing his familiarity with this material. In case he does not remember the discussion which applies to any heading he rereads the paragraph again carefully. Just before class the next day he reviews by reading the headings and going over in his mind what is contained in each paragraph. If he is doubtful about any of the content he studies it again. He looks up words which are totally unfamiliar, locates on the map places mentioned in the text, and memorizes important dates although very few dates are required in class. He is accustomed to criticize the author's statements, occasionally notices where the author has contradicted himself, and brings up such a point in class for discussion. Frequently he finds it necessary to review in order to connect up the present lesson with what has gone before. He does no outlining except as it is assigned.

First year algebra. J. D. was in the freshman class, was almost fourteen years old, and had, according to his score of 186 on the Otis Group Intelligence Scale, a mental age of approximately twenty years. He was tall, well built physically, alert, generally interested, and considered by his principal "one of the finest all-round boys in

¹The Otis Group Intelligence Scale had been given to all these students at the beginning of the school year.

the school." He made no preparation for the interview as had N. W., whose study procedure was discussed in the preceding paragraph. He was, however, able to give a rather full account of his method of study in algebra.

J. D. usually prepares his assignment during the three o'clock period but in case the lesson is so long that he is unable to finish it during this time he completes it at home. He never finds his mind wandering in algebra and never feels the need of conscious effort to concentrate. At any time he thinks it necessary he reviews the previous lesson but this does not occur frequently. In case the teacher's explanation of new problems has not been sufficient to make them clear he studies the supplementary explanation and the sample exercises in the textbook. Even though he has understood the teacher's explanation he always looks over the explanatory exercises in his book to see if there is anything which the teacher failed to mention. In an effort to understand a given type of exercise he compares it with arithmetical problems of the same type. In case he makes an error which he is unable to locate he leaves the exercise for a while and then works it again on a new sheet of paper. He does not commit to memory formulas and rules word for word but remembers them as they are applied to some sample exercise. He reviews at the end of a chapter or section only when the teacher assigns a review and in that case only when he feels that he does not understand the material of that section.

Third year English literature—poetry. A. N. was almost twenty-three years old and had returned to high school after teaching several years. She was taking six subjects in order to graduate in June, 1923, was working very hard, and was hoping to be able to continue her education. Her intelligence test showed her average for her age. She had not been informed previously of the purpose of the interview and consequently had made no preparation for it. She gave in a clear manner some details of her method of study, but was unable to diagnose her procedure sufficiently to give an approximately complete statement. As the first step in the preparation of a new assignment, A. N. reads an entire poem through rather rapidly to get the main ideas, then reads it a second time more slowly in order to note details. She studies the notes given in the book, looks up words of which she does not know the meaning, and occasionally attempts to analyze sentences as an aid in clearing up the meaning of difficult passages. In this course, the life of the author is not studied

until after his work has been taken up in class, and the students were requested at the beginning of the study of a particular poet to find out from his writings as much as possible about his life and personality. A. N. is accustomed to underline passages which seem to give information concerning the poet or to indicate important characteristics of the poem. Also she occasionally jots down on the margin of the page thoughts concerning the poem. Frequently she has difficulty in keeping her mind on the work but this may be due to the fact that she studies in the living room at home surrounded by her family.

First year English literature—prose. M. G., a freshman student, was thirteen years old with a mental age of seventeen years. In her school work, as in her life outside, she was inclined to be somewhat erratic, devoting herself with enthusiasm to anything in which she was for the time interested. Because of her superior mental ability and of her general alertness she was able to make fairly good grades in spite of a careless and somewhat indifferent attitude toward study. In English literature, however, her favorite study, she was accustomed to make "A's." She had made some preparation for the interview and could give readily the information concerning the method by which she studied her assignments in English. The material in this course was taken from the Atlantic Classic Series containing a selection of essays, short stories, etc.

M. G. described the first step in her procedure in much the same way as the preceding student, a hurried reading in order to get the general trend of thought, followed by a more careful and detailed analysis. She usually reads the notes given, looks up words with which she is totally unfamiliar and occasionally "finds certain of the authors' statements that seem absurd and asks the teacher about them." She next attempts to answer the questions given at the end of the selection, and if unable to do this, she rereads portions of the text until she has cleared up her difficulties. She is accustomed to study her literature at school during the eleven o'clock period, the recitation coming at one o'clock, and sometimes is forced to make a distinct effort in order to concentrate upon her work.

Second year English—language and composition. In order to understand fully the statement of the procedure of study employed in language and composition it is necessary to know something of the course and of the method of presentation. The instruction was individualized and each member of the class was given a mimeo-

graphed outline which would ordinarily cover the work of two semesters, that of the second semester of the sophomore and the first semester of the senior year.² There were two main divisions of the outline, the first dealing with the grammatical and rhetorical construction of the sentence, the second with the construction of the narrative, unity, coherence, etc. As each student completed certain sections or problems he took a test which, if satisfactory, enabled him to pass on to the next problem. During the class period, the teacher directed the individual pupils, discussed general principles, answered any questions asked by the students, and kept a general oversight of the work being done.

The student, A. J., selected for the interview upon this subject, was a sophomore, thirteen and a half years of age with the intelligence of a superior adult. Her score on the Otis Group Intelligence Scale was 213, and her scores on the Monroe Standardized Silent Reading Test, Form B: Comprehension 81, Rate 151, were the highest made among the entire student body. Before entering high school, her training had been somewhat different from that of the other students interviewed. She had been taught by her parents until she was eight years old, at which time she entered the fourth grade, and completed the elementary school in three and one-half years. In her home training, concentration and rapid work had been emphasized from the time she began reading at four years of age. If she seemed tired, or for any reason was unable to exhibit her usual interest in her lessons, she was not allowed to loiter over them but was sent out to play, and the work postponed. Throughout her school life her teachers have commented upon her ability to concentrate and to think quickly as contributing largely to her success. In the English composition course, opportunity was given her to use such ability to advantage, she completed the work of both semesters in one, and made a grade of A on the same final examination which the seniors had taken with an average of B and C.³ Although she had made no preparation for the interview she apparently gave a rather full account of her method of study in this course.

In preparing a new assignment, A. J. is accustomed to consult several reference books for explanations of topics and sub-topics in the outline but in case she cannot find satisfactory material she asks

²The work in English during the junior year was devoted entirely to literature.

³It is of interest that N. W., the first student whose interview is reported in this chapter, completed the same amount of work as A. J. and made the same final grade upon the course.

the teacher for help. After completing to her own satisfaction this portion of the assignment, she studies the sample sentences in the books to which she has referred, writes out and corrects a few original sentences containing the errors described, etc., and then has a consultation with the teacher regarding her work upon the entire section of the outline. If, in the teacher's judgment, she has completed her study of the problem satisfactorily, she takes the test upon it and passes on to the next division. She makes a conscious attempt to study without wasting time and says that she has no difficulty in concentrating. In case a previous problem is connected with the new one she reviews the first before beginning her study. In writing a theme she selects her own topic, choosing it usually from a list which she has jotted down from time to time. She rewrites and corrects the theme several times, reads it over both silently and aloud, and then lays it aside until the next morning when she goes over it again before the final copying. She does this because after a lapse of time she is frequently able to discover errors and imperfections which she has failed to notice. She uses the dictionary for correcting spelling and for finding synonyms and new words, and, unless the teacher has requested her not to do so, she consults reference books regarding punctuation and other doubtful points.

CHAPTER VI
SUMMARY AND SUGGESTIONS FOR GIVING TRAINING
IN STUDY PROCEDURE

Conditions in University High School not typical. Relatively small classes and a high quality of instruction in the University High School tend to reduce the number of students who are not successful in their school work. Furthermore, the teachers have attempted to give some training in good methods of study. As such conditions are not typical of high schools in general, the results of this investigation should be considered as only roughly indicative of the influence of study procedure upon school standing.

Ineffective study procedure a cause of low standing. The students of the experimental group were found to follow, in the judgment of the investigators, inefficient methods of study. Other factors, however, such as lack of effort, poor physical condition, inability to read effectively, and in certain cases below normal mentality, contributed to the unsatisfactory work of these students. Thus, the cause of low school standing was found to be complex, and the data collected in this investigation do not lead inevitably to the conclusion that the lack of an efficient study procedure is the fundamental cause of poor school work in the case of a large percent of high-school students. However, the writers feel justified in stating that a number of the high-school students who are doing unsatisfactory work have the capacity to maintain a much higher standing, and that an attempt to train such students in a good technique of study would prove successful in many cases. Furthermore, the writers believe that if such training were begun in the elementary schools, fewer failures would be found among high-school students.

Defects in study procedure. Although this investigation was not sufficiently exhaustive to expose all deficiencies in study procedure, those defects which were especially prominent probably may be considered as among the types occurring most frequently. These are listed as follows:

- I. Inability to read typical textbook material in an effective manner.
- II. Study conceived largely as a process of memorizing the textbook.

- III. Failure to organize and summarize the material studied.
- IV. Failure to review at appropriate intervals.
- V. Lack of a regular time and place for study.
- VI. Failure to concentrate upon the assignment.
- VII. The practice of quitting the lesson before the best preparation of which the student feels he is capable, has been made.

Results of remedial training in reading and study procedure.

Retesting in silent reading at the end of the period of training showed that some students had made very notable gains in reading ability; the increase varying from one-half a year to six years. With certain students, the training in study procedure resulted in an improvement in their school work, but with others there was no direct evidence of any success. This failure to improve was probably due to the fact that the training period was short and in some cases was handicapped by an extreme lack of ability to read. It is believed by the investigators that if training in study procedure could be carried out systematically during the entire school year it would prove effective in the majority of cases.

Training in study procedure systematically planned. In reporting this investigation, the procedure followed in giving training in the technique of study has been described rather fully in the hope that it might suggest methods to teachers desirous of giving such training to their students. As a preliminary step, the teacher should endeavor to identify the particular defects in the study procedure of each student, although it may not be necessary to follow a plan as elaborate as that described on page 10. This outline, however, is suggestive of items of information that may be collected. At least one general intelligence test should be given and probably should be supplemented by one or more tests of ability to read silently. In some cases informal tests will prove very helpful, but will need to be adapted to the particular case being studied. Valuable information also concerning the pupil's standing and shortcomings may often be secured from consultations with his different teachers. In order to be effective, training in study procedure should be based upon an understanding of the individual needs of the pupils concerned, should be designed for specific purposes, and should be planned with care. Furthermore, such training should never be treated as incidental but should be made a definite order of business.

Administrative plan to be employed in training in study procedure. One of the most important factors to be considered, in introduc-

ing into a school system a method of teaching pupils how to study, is the administrative plan which should be employed. In an endeavor to supply a solution for this particular administrative problem, various plans of supervised study, so-called, have been put into practice. Although supervised study varies in certain details in different school systems, fundamentally it presupposes study by a group of students under the guidance of a teacher. Usually each teacher directs the study in his own subject. The query has been raised as to whether it would not be more effective to have a specialist who would devote all his time to the direction of study. Other questions concerning the proper grouping of the students, who are to receive the training in study procedure, have arisen. In the present investigation, a specialist, who had made an extensive study of methods of learning and who had been trained in the giving of tests and in individual diagnosis, attempted within a limited period to give training in effective study procedure in certain school subjects to a small group of poor students. A brief discussion of the advantages and disadvantages of this plan, as suggested by the investigation, may indicate appropriate answers to the preceding questions.

Who should give training in methods of study? The experience of the investigator demonstrated the necessity for perfect familiarity with the work of the course and with individual needs and capabilities. In order to give effective training in study procedure in any school subject, the director should be familiar with the nature of the subject-matter, the method of its presentation, and the objectives of the course. In addition, he should follow the assignments day by day and know the material which is covered. Much of the work, necessarily in such a case, would duplicate that of the classroom teacher. In the opinion of the investigator, the time and effort required for a special teacher to familiarize himself with the work of the varying classes will be too great, from an administrative point of view, to permit of adequate returns.

Certain persons, who have advanced the opinion that special teachers should be employed to direct the study of pupils, give as their reason the argument that a proper performance of this function requires someone who has had more specialized training than the classroom teacher usually possesses. It is true that the classroom teacher is often not sufficiently trained in the specific problems connected with teaching pupils how to study, but it is believed that this lack of training may be obviated to a considerable extent by detailed

directions for carrying on types of training which have proved effective in developing successful study procedures. It is necessary that the training be such as may be given in connection with the classroom instruction and that the description be easily understood even by persons somewhat unfamiliar with the problems of teaching how to study. Under these conditions, therefore, it is believed that the classroom teacher, as the result of his familiarity with the work of the course and the nature of the needs and capabilities of the pupils, will prove more successful in this task from the point of view both of the administration and of the effectiveness of the results secured.

Individual or group instruction. Individual instruction, the method used in the present investigation, doubtless has advantages for certain types of pupils which group instruction does not possess. It is evident that individual instruction, however, of large numbers is impractical from an administrative point of view. Probably, it will be found convenient in most cases to have the class as a unit of instruction, and provided the class is not too large, it is believed that this will prove satisfactory for the greater number of students. Pupils who have difficulty in doing independent work may be formed into a small group for instruction, or perhaps in certain cases may be given some individual training in methods of study.

CHAPTER VII

BIBLIOGRAPHY

ALBERTY, H. B. "Directing the study of pupils—a hand-book for teachers and school administrators." Cleveland, Ohio: Cuyahogo County Board of Education, 1922. 39 p.

The author attempts to present in a brief manner a technique for teaching the proper methods and habits of study. His suggestions, which are taken almost verbatim from recent authors, represent a summary of the most important specific directions and devices for training in methods of study. Little space is devoted to a discussion of the principles underlying study procedure other than that absolutely necessary to explain items of technique presented. As an illustration of the proper use of the technique to be employed, lesson plans in history and literature are given. A plan for conducting teachers' meetings or directing the study of pupils is also set forth.

ALDERMAN, GROVER H. "The lecture method vs. the question-and-answer method," *The School Review*, 30:205-09, March, 1922.

Results of the experiment reported in the present study indicate that pupils in Grades VII, VIII, and IX remember more factual material when taught by the question and answer method and that in Grades X, XI, and XII more material is remembered when the lecture method is used.

ANDREUS, LEONARD STERLING. *Essential Principles of Teaching Reading and Literature*. Philadelphia: J. B. Lippincott and Company, 1922, p. 138-99.

The author of this volume emphasizes the necessity for definitely separating the teaching of reading from the teaching of literature. He states that a prerequisite of increasing the reading efficiency of a class is a reliable determinant of the level of the reading ability of individual children and he discourages brief measures which may be used in securing such a determinant. He also presents a variety of methods for remedying defects in reading.

BARR, A. S. "An analysis of the larger mental processes involved in the study of elementary school history," *The Educator Journal*, 21:263-68, January, 1921.

The mental processes involved in the study of elementary school history are disintegrated into their most important elements, but no attempt to secure a basis by experimentation for such an analysis is reported. The following are given as the most important mental processes involved in the study of history: ability to read the material at hand; ability to comprehend historical material; placing of content into technical historical terms; selection of facts which are of sufficient importance to be retained; ability to understand time relations or the placing of events in time; and the placing of facts in their causal relationships.

CHAPMAN, J. C. and FEDER, R. B. "The effect of external incentives on improvement," *Journal of Educational Psychology*, 8:469-74, October, 1917.

A contrast of performance is made between two fifth-grade classes, similar in all respects except that one group is stimulated by external incentives and the other is not. The results secured show a higher grade performance in the group motivated by rewards.

COLGROVE, CHAUNCEY P. *The Teacher and the School*. New York: Charles Scribner's Sons, 1911, p. 290-317. *The Pupil's Study of the Lesson*.

The aims of the "study lesson" are given as follows: (1) to acquire power to master books independently; (2) to acquire power of systematic thinking; (3) to form the habit of self-controlled work; and (4) to develop a sense of personal responsibility. An attempt is made to define the nature of study. Certain conditions which may hinder study are enumerated as: (1) the child's previous mode of learning; (2) a sudden change from oral to textbook study; (3) the fact that textbooks in themselves are no stimulus to effort; (4) physical conditions; and (5) outside interests. A method of lesson study is outlined, and the means whereby teachers may help pupils to study are suggested.

COLVIN, S. S. "Fundamental elements in learning and teaching." *Proceedings of the First Annual Educational Conference Held April 7-8, 1921*. *The Ohio State University Bulletin*. Columbus: Ohio State University, 1921, p. 12-19.

The author states the following principles which he believes must be considered at every level of learning processes:

1. The law of simple associative connections.
2. The law of the conditioned reflex or associative shifting.
3. The law of multiform activity, or trial and error.
4. The law of directed learning, restriction of the field of trial and error.

He explains these laws and gives illustrations and examples of their proper and improper usage in classroom procedure. In discussing the fourth law he gives the following methods for securing a restriction of the field of trial and error: (1) rewards and punishment; (2) control of the environment; (3) furnishing the learner with a copy; and (4) the development of free ideas, concepts of method, and notions of procedure.

COLVIN, S. S. *An Introduction to High School Teaching*. New York: The Macmillan Company, 1921, p. 360-81.

Two reasons given in this chapter for the desirability of supervised study are: "The learner is often given unwise aid by parents or friends," and "when a pupil is not directed in his work he often acquires blundering and wasteful methods of study." In the enumeration of purposes to which the supervised study period may be devoted, emphasis is placed upon the fact that "it may be used to habituate the learner in the technique of study." In the discussion which follows of "fundamental principles to be emphasized in the technique of learning" the conditions conducive to effective study are explained. Also suggestions as to methods of study of certain types of material are given. The author presents the objections that have been advanced against the employment of supervised study in the elementary and sec-

ondary schools, and makes an attempt to answer the most important of these objections by setting forth the chief administrative plans of supervised study that have found their way into various school systems.

COWAN, EDWINA ABBOTT. "An experiment on the influence of training on memory." *Journal of Educational Psychology*, 7:31-38, January, 1916.

The results of an experimental study with ten high-school girls, aged eleven to thirteen, indicate the possibility of forming by direct means a habit which may be general in its effect.

DAVIS, S. E. *The Work of the Teachers*. New York: The Macmillan Company, 1918, p. 222-54.

The aim of this chapter is to give teachers a certain amount of preparation for directing pupils' study. The conditions essential to effective study, including motivation, concentration, recognition of the nature of the lesson being studied, and the proper use of memorization, are presented. Considerable space is devoted to a presentation of suggestions for making the study period effective. These suggestions largely take the form of basic principles rather than actual classroom devices to be applied. Specific causes of waste in study such as inability of pupils to read, and studying without a recognized plan are given. The methods for securing an effective use of textbooks in the study period are also set forth.

DEARBORN, GEORGE VAN NESS. *How to Learn Easily*. Boston: Little, Brown and Company, 1918. 227 p.

The author intends that this volume represent a hand-book of practical hints on economical and productive methods of study. The first chapter is devoted to measures of economy in the general study process and enumerates, explains, and illustrates the factors of economy. In Chapter II, the best methods to be employed in observation and in the taking of notes are presented. The next chapter entitled, "Educative Imagination," sets forth the means for insuring a more advantageous use of information which has been secured through observation and note-taking, and discusses the place of memorization or reproductive imagination, and of constructive imagination or the power of foresight in the learning process. In the last chapter measures leading to efficient performance on examinations are presented.

EARHART, LIDA B. *Teaching Children to Study*. Boston: Houghton Mifflin Company, 1909. 182 p.

This book represents one of the earliest comprehensive treatments of the problem of teaching children to study. It is based to a considerable extent on experimental work and many conclusions which it presents are drawn from the classroom work of teachers and pupils. The author first describes in a clear, logical fashion the process of logical study, both inductive and deductive. She analyzes the study process into the following factors: (1) recognition of the problem; (2) gathering of data relating to the problem; (3) organization of data into groups of related ideas; (4) judging the soundness of statements or significant facts bearing upon the problem; (5) verification of conclusions; and (6) fixing of knowledge or memorization. The author next takes up the form which these two processes of logical study assume under the limitations of schoolroom procedure and explains the form which each factor in the process of study takes in textbook study. She concludes as a result of certain tests that children do possess the ability to study logically, but that they are not taught at present how to do so. In the final chapter

she presents excellent suggestions for training children to study. These suggestions in many cases are not specific statements of methods to be employed but a careful explanation of principles which point the way to the devising of methods for each teacher's use.

EARHART, LIDA B. *Types of Teaching.* Boston: Houghton Mifflin Company, 1915, p. 192-218.

A brief explanation of the nature of study is given, and the following suggestions for training pupils for independent study are presented: (a) to find the aim or problem; (b) to judge of hypotheses; (c) to collect and evaluate data effectively; (d) to organize material; (e) to defer conclusions and form independent judgments; (f) to test conclusions, and (g) to understand material memorized. Devices for testing the advancement of pupils in ability to study effectively, and the quality of the teacher's instruction in securing effective study procedure are suggested.

EDWARDS, A. S. *The Fundamental Principles of Learning and Study.* Baltimore: Warwick and York, 1920. 239 p.

The aim of this volume is stated as follows: To show how results of general psychology, experimental psychology and allied sciences can be put into use by the teacher and student in problems of learning and study. The importance of the "Habit Theory" to educational practice and thought is emphasized, and methods of habit formation are presented. Additional principles underlying study procedure are discussed also in considerable detail. One chapter is devoted to specific suggestions for studying and teaching how to study, expressed for the most part in the form of rules. With the exception of this chapter the volume differs only in organization and emphasis from a number of others on the same subject.

FINCH, CHARLES E. "Junior high-school study tests." *The School Review*, 28:220-26, March, 1920.

"This article attempts to give some idea of the reason for giving the tests, the particular object of each test, the test itself, and finally some conclusions which have resulted from a study of the tests, especially the problem of using study periods in schools most effectively." Remedial measures for increasing effective silent reading study which were used by teachers after an examination of the results of the four study tests, are explained at the end of the article.

FREELAND, GEORGE E. "A year's study of the daily learning of six children." *The Pedagogical Seminary*, 28:97-115, June, 1921.

In this report one child possessing normal intelligence was chosen from each of the first six grades. The children practiced the touch system in typewriting for a period of ten minutes every school day throughout the year. A record of their performance was kept, the study of which indicated that vacations have a varied influence on the learning process. During the earlier stages of the practice, before the function was well mastered, vacations tended to cause a decrease in the quality of the work but later seemed to have very little influence "on the nature of performances." It was found also that each child reached a plateau and remained there, and that special effort was necessary before this lack of progress could be overcome.

FREEMAN, F. W. *How Children Learn.* Boston: Houghton Mifflin Company, 1917. 322 p.

In the present volume the author takes up the growth of the child's mind, and shows how good instruction in any subject and in all parts of the school system must be founded on certain general applications of psychology to the responses

which are both natural and acquired with children as these relate to their play, imitation of others, self-assertion, social attitudes, skills, perceptions, association, memorizing and the thinking process. He formulates the principles of mental growth in children, and devotes a chapter to a discussion of the transfer of training, and to the presentation of the principles of mental hygiene and mental economy.

GRAY, WILLIAM SCOTT. "Remedial cases in reading: their diagnosis and treatment," *Supplementary Education Monographs*, No. 22. Chicago: University of Chicago, 1922. 208 p.

The present monograph represents a careful study of the reading deficiencies of a considerable number of individual cases together with a discussion of the method of remedial training employed. Fourteen influential causes of failure in reading were discovered and are described briefly; as, in terms of, "their inferior learning capacity, congenital word blindness, poor word memory, defective vision, narrow span of recognition, regressive eye movements, inadequate training in phonetics, inadequate attention to content, inadequate speaking vocabulary, a small meaning vocabulary, special defects, lack of interest, guessing, and timidity." The author states that other less important causes of failure were discovered in addition to the ones mentioned in the preceding sentence. In Chapter III, a description of the methods employed in individual cases, consisting of both a statement of a method of diagnosis containing both informal and formal tests of reading, and a presentation of the information blank for securing the history of each case, as well as some of the more commonly used measures for remedial training is presented. The remainder of the volume is devoted to a description of the individual cases. Each case is discussed with regard to the preliminary diagnosis of reading deficiencies, the remedial instruction employed and the results of the instruction.

HALL-QUEST, A. L. *Supervised Study*. New York: The Macmillan Company, 1917. 433 p.

The book opens with an enumeration of the social and educational conditions that have stimulated educators to revise methods of class management and that have led to the necessity for supervised study. The author next discusses the meaning of supervised study, its limitations of function, and the misconceptions concerning its nature. He defines supervised study as "that plan of school procedure whereby each pupil is so adequately instructed and directed in the methods of studying and thinking that his daily preparation will progress under conditions most favorable to a hygienic, economical, and self-reliant career of intellectual endeavor." Considerable emphasis is placed upon the discussion of "proper conditions of and hindrances to study." The environmental, physical, and psychological conditions which promote or hinder study are presented and methods for insuring conditions conducive to effective study are given. The author next describes in some detail the administration of supervised study. An important part of this description is the explanation of the chief administrative plans which have been employed. Two chapters are devoted to a presentation of methods of directing students in an effective study procedure. The methods of studying described in these chapters have as an objective the development in each student of "skill in the handling of textbooks, summaries, underscoring, outlining notebooks, reports, supplementary reading, memorizing, and thinking with the constant checking of progress by careful application." These are the tools which he must use. If he becomes skillful "he will be able to undertake new tasks alone and also to evolve methods of work which for him are peculiarly successful." In Part II of this volume methods of supervising the study of English, history, civics, mathematics, sciences, languages,

and of the fine and practical arts are discussed in some detail. A summary of the attempts which have been made to measure the results of supervised study is given in the final chapter.

HINSDALE, B. A. *The Art of Study*. New York: The American Book Company, 1900. 266 p.

One of the earlier attempts to explain the nature of study, the processes involved, and the principles underlying study is represented by this work. Especial attention is paid to a discussion of the relation existing between learning and teaching and to a description of mental processes such as attention and interest. Methods of learning are discussed in terms of the psychological processes involved, and emphasis is placed upon the importance of more classroom activity on the part of the students.

JOHNSTON, CHARLES H. AND OTHERS. *The Modern High School*. New York: Charles Scribner's Sons, 1914. p. 265-94.

The chapter on the Direction of Study was written by A. L. Hall-Quest. He attempts first to define the meaning of study and gives the definitions which had been offered by several investigators in this field. Certain elements which are present in any study process are enumerated. In discussing factors in the technique of study he emphasizes the importance of directed study and describes important administrative plans for supervised study which have been employed in different school systems. An important factor in the technique of study is the student's ability to use a textbook, and the author explains in a general way methods by which this may be accomplished. Under the head "conditions of effective studying" the relation of the surroundings and the physical condition of students to effective study is discussed.

KILPATRICK, WILLIAM H. "Mind-set and learning," *General Science Quarterly*, 6:433-41, March, 1922.

Mind-set is explained as "mind-set-to-accomplish-a-purpose." It tends to further activities favorable to the purpose and to inhibit activities which are unfavorable to the purpose.

McMURRY, F. M. *How to Study and Teaching How to Study*. Boston: Houghton Mifflin Company, 1909. 324 p.

The author first discusses the need for teaching students how to study and the seriousness of the present failure to accomplish this. He attempts to explain the nature of study and analyzes it into the following factors: (1) provision for specific purposes of study; (2) the supplementing of thought; (3) the organization of ideas; (4) judging of the soundness and worth of statements of facts; (5) memorization; (6) putting ideas into practice in actual activities of life; (7) provision for tentative rather than a fixed attitude toward knowledge; and (8) provision for individuality in knowledge. He devotes a chapter to the explanation and illustration of each of these factors and to the discussion of their relation to schoolroom procedure. The latter is expressed in a general fashion and contains few classroom devices to be used in directing the study of children.

MEYERS, G. C. "Learning against time," *Journal of Educational Psychology*, 6:115-16, February, 1915.

In an experiment pertaining to "the effect on efficiency of learning against time," two groups were requested to learn a list of words. The first group, which consisted of thirteen subjects, was given all of the time necessary, and averaged

fourteen minutes and forty-seven seconds; the second group of twenty-four subjects, was limited to nine minutes. Among other results favorable to learning against time it was found that almost one-half of the second group made a perfect report in the same amount of time in which only one of the first group made a perfect report.

MILLER, HARRY LLOYD. *Directing Study*. New York: Charles Scribner's Sons, 1922. 377 p.

The first chapter of this book is devoted to a presentation of various illustrative procedures for directing "study toward mastery through creative thinking." These are expressed in terms of the types of procedures which may be used rather than of specific methods and devices to be employed. They are intended to prove suggestive and to provide a theory and plan of organization of classroom work in which students may be directed in the most effective procedure of study. Individual differences in children are recognized and methods of dealing with these differences in order to secure higher types of study activity are presented. He proposes as "a guiding idea to all teachers, that we give boys and girls things to do, in the doing of which they will find out what we would like to have them know." This volume is especially valuable in that it recognizes that study is a diagnostic process and must achieve its results through the highest type of creative thinking.

MITCHELL, DAVID. "Variability in memory span," *Journal of Educational Psychology*, 10:445-57, November, 1919.

In this study an experiment with fifth and seventh-grade children on the "variability in memory span" is reported. The results indicate that the memory span of children is not a static quantity. The position of the individual child in the rank order of group changes materially from day to day. However, in considering the average performance of a group this variability need not be taken into consideration.

MURPHY, HERBERT HAYES. "Distribution of practice periods in learning," *Journal of Educational Psychology*, 7:150-62, March, 1916.

An experiment designed to measure the relative merits of daily and of alternate day's practice in muscular activities with normal school junior and senior girls is described. Two types of muscular activities are included, javelin throwing and left-hand throwing. It was discovered that practice by alternate days caused a more rapid increase in ability than daily practice. The author believes that these results would apply to school work and concludes that recitation three times rather than five times a week would result in an equal amount of progress.

PARKER, S. C. "Problem solving and practice in thinking," *Elementary School Journal*, 21:16-25, 98-111; September, October, 1920.

These articles are designed to acquaint teachers with the proper technique of problem solving and to make them aware of the elements of skill in effective thinking. The discussion is divided into four sections: I. Problems of everyday life; II. Actual lessons illustrating problem-solving in school; III. How skilled problem-solvers think; IV. Rules for training pupils in effective problem solving.

POFFENBERGER, A. T. "The influence of improvement in one simple mental process upon other related processes," *Journal of Educational Psychology*, 6:459-74, October, 1915.

An intensive study was made of a small number of subjects to discover the influence of improvement in one simple mental process upon other relative processes. The following conclusions were reached:

1. Where there were no identical bonds between the stimulus and the response in the two processes there is neither transfer nor interference.
2. Transfer occurs where identical elements exist in the two processes.
3. If practice in one process necessitates the breaking of bonds which have been formed previously, interference occurs.

PLYLE, W. H. "Individual learning capacity constant for different types of material." *Journal of Educational Psychology*, 10:121-28, March, 1919.

In an experiment which was conducted to discover the constancy of individual learning capacity with reference to four different types of material; substitution, nonsense syllables, card distribution and marble distribution, an average intercorrelation of 0.503 between all of the tests was secured. From this, the author concludes that there likely exists a constant factor, which may be called general learning capacity, due to the ease of bond formation in the central nervous system. The subjects were all over the age of twenty-one. They had received a widely different education and their experiences in life had been varied. Therefore they brought to these experiments not only different learning capacities but other differences which doubtless acted as disturbing factors. The author states that "there is considerable evidence that if all the disturbing factors could be removed, the true correlation would be much nearer uniformity than the raw correlation which we have actually found."

RICH, GILBERT J. "Directed attention and learning," *Journal of Educational Psychology*, 8:239-40, April, 1917.

The author describes an experiment, conducted for the purpose of securing evidence concerning the effectiveness of directing the attention of pupils to the middle of a series of syllables or of a selection of poetry. In alleviating the difficulty in learning caused by the fact that the beginning and ending of a series or of a selection is learned more readily than the middle, the results show that this procedure is advantageous for serial material but not for non-serial material.

SEARS, J. B. *Class Room Organization and Control*. Boston: Houghton Mifflin Company, 1918, p. 173-87.

In this chapter "the importance of right methods of study when they are extended to all the aspects of school work, and correlated as far as may be without outside activities, has been pointed out as have actual steps in the study process." Proper management of study emphasizes the need for (1) a clear aim, (2) a real motive for study, such as is represented by actual problems, and (3) ability to find and organize material that will solve these problems. It "must result finally in critical attitudes toward facts and in sound habits of work."

SIMPSON, MABEL E. *Supervised Study in American History*. New York: The Macmillan Company, 1918. 278 p.

The author describes a method of supervised study devised and employed by herself for teaching pupils how to study history. A large number of lessons are outlined in detail in order that any teacher may put into application the principles involved. An attempt is made to shift the center of interest in the classroom from the teacher to the students and to guide pupils into independent, purposeful and effective study. The author has frequently employed the socialized recitation. "Other teachers very likely would supervise study very differently from the procedure described in this book; but here is one method that has awakened young

pupils from lethargy and even hostility to a real enthusiasm for the study of history. By this method they were introduced to social obligations and privileges."

STRAYER, GEORGE D. *A Brief Course in the Teaching Process*. New York: The Macmillan Company, 1912, p. 86-99.

Methods whereby children may be taught to study most effectively are presented and discussed. Under memorization, methods of teaching children how to memorize by wholes rather than by parts are explained. Rules and suggestions for habit formation in pupils are also given.

STRAYER, GEORGE D. AND NORSWORTHY, NAOMI. *How to Teach*. New York: The Macmillan Company, 1917, p. 220-33.

The authors attempt to set forth the elements of effective study. They suggest classifications of study according to various criteria. The following general factors involved in all types of study and therefore fundamental to good habits of study are discussed: "(1) a clear purpose; (2) a vital interest of some kind; (3) concentrated attention; and (4) a critical attitude." Additional suggestions peculiar to special types of study are given.

THOMAS, FRANK W. *Training for Effective Study*. Boston: Houghton Mifflin Company, 1922. 251 p.

The author of this volume places the emphasis in the teacher training process, on organizing pupils to study effectively and to learn to think. He would have "the children do the thinking and more of the talking in the recitation." The function of the teacher is then changed from that of hearing recitations to that of guiding and directing pupils to study and think. In the earlier pages of the book the present schoolroom practices, which are unfavorable to effective study, together with the methods for improvement are discussed briefly. In pointing out the essentials which insure success in guiding pupils toward the acquisition of skill in studying, the author states four fundamental conditions necessary to good study. Considerable space is devoted to the explanation and presentation of methods for securing these conditions. A number of suggestions for training pupils how to study in each of the four different types of study activities are set forth. The "ability to engage in independent self directed effort is continually emphasized as the goal for all training in study."

THORNDIKE, EDWARD L. "Instruments for measuring the disciplinary values of studies," *Journal of Educational Research*, 5:269-79, April, 1922.

Tests designed to measure an increase in the ability to generalize, to understand symbolism, to see relationships, and to organize material, which might be brought about by the study of grammar, languages, and mathematics, are presented. No results of the use of the tests are given.

THORNDIKE, EDWARD L. "The permanence of school learning," *School and Society*, 15:625-27, June, 1922.

Some suggestions as to the permanence of school learning in algebra were secured as the result of a somewhat informal experiment carried on with college freshmen and with individuals doing their first year of post-graduate work. Both groups were required to perform exercises of approximately equal difficulty. The freshmen who were at that time studying algebra were able to complete four or five tests, while the older students averaged only three. A smaller loss in material learned than was formerly believed seems indicated by this experiment.

WILEY, J. A. *Practice Exercises in Supervised Study and Reading.* Cedar Falls: J. A. Wiley, Iowa State Teachers College, 1922.

The author of this study recognizes the importance of effective reading to efficient study procedure. However, in his suggestions for the derivation or application of these exercises, no attempt is made to separate reading from study procedure. He states that "this book is constructed on the theory that skillful study involves a great variety of specific study habits, each of which must be built up in conformity with laws of habit formation." Consequently, the exercises are designed for a variety of purposes. The title of the book seems somewhat misleading in regard to the actual presentation exercises, as the author goes no farther than a careful explanation for their devising.

WILSON, H. B. *Training Pupils to Study.* Baltimore: Warwick and York, 1917. 72 p.

This book is one issued in a series of the Topeka, Kansas, Public Schools, in order to aid the teaching staff in their efforts to train pupils to study effectively. It contains a record of "the different things which teachers reported they did in training their pupils to study." An attempt is made to analyze the factors in study, and the methods employed by teachers in each of the various grades for promoting eleven factors are given. This volume contains excellent suggestions, especially for the lower grades, in training pupils to study.

ZIMMERS, P. J. *Teaching Boys and Girls How to Study.* Madison, Wisconsin: The Parker Educational Company, 1917. 39 p.

In this brief report an account is given of an experiment conducted in the schools of Manitowoc, Wisconsin, for the purpose of promoting effective study on the part of students. An investigation of classroom procedure, in regard to the nature of student activity and the relative amount of student and teacher activity was made throughout the schools. After an intensive training given the teachers as to principles and methods of directing study procedure, classroom instruction was reorganized on the basis of promoting student activity. Definite standards to use in judging the effectiveness of the recitation were given both teachers and supervisors.

After this plan of classroom procedure had been in operation two years, an examination of the results indicated that student activity occupied by far the greater portion of the classroom work, whereas formerly from 70 to 90 percent had been devoted to teacher activity. The following were given as the most important changes resulting from the concerted action of all the teachers to train pupils in effective methods of study: (1) Responsibility and self-activity engendered on the part of pupils; (2) Responsibility for the conduct of the class work assumed largely by pupils; (3) Pupils able to select basic and salient facts with the details necessary to support them, and then to eliminate the remaining information; (4) Problems in discipline reduced to a minimum because the laws of the school not regarded by pupils as impositions from without.

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BULLETIN NO. 20

BUREAU OF EDUCATIONAL RESEARCH
COLLEGE OF EDUCATION

TRAINING IN THE TECHNIQUE
OF STUDY

By

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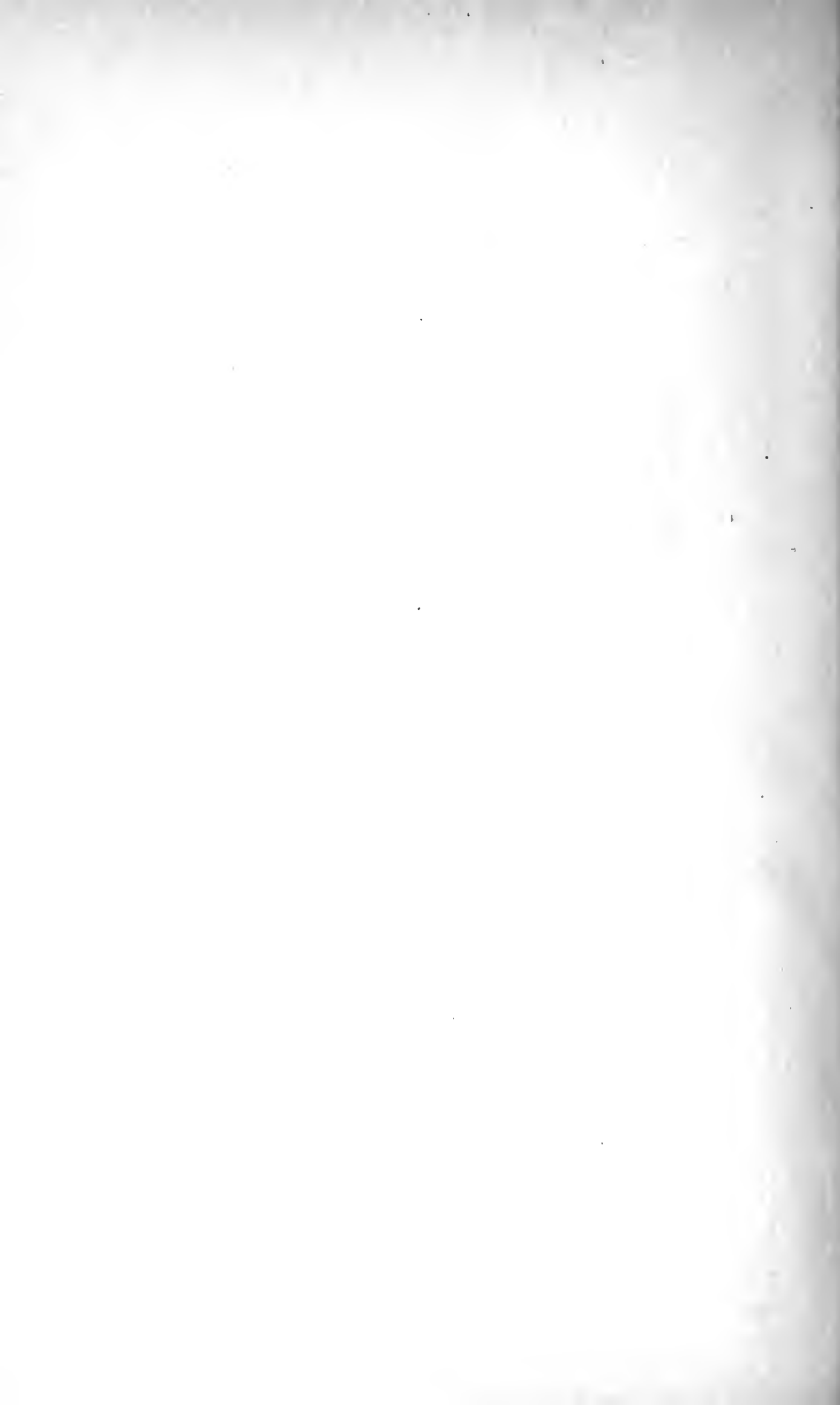
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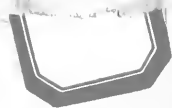
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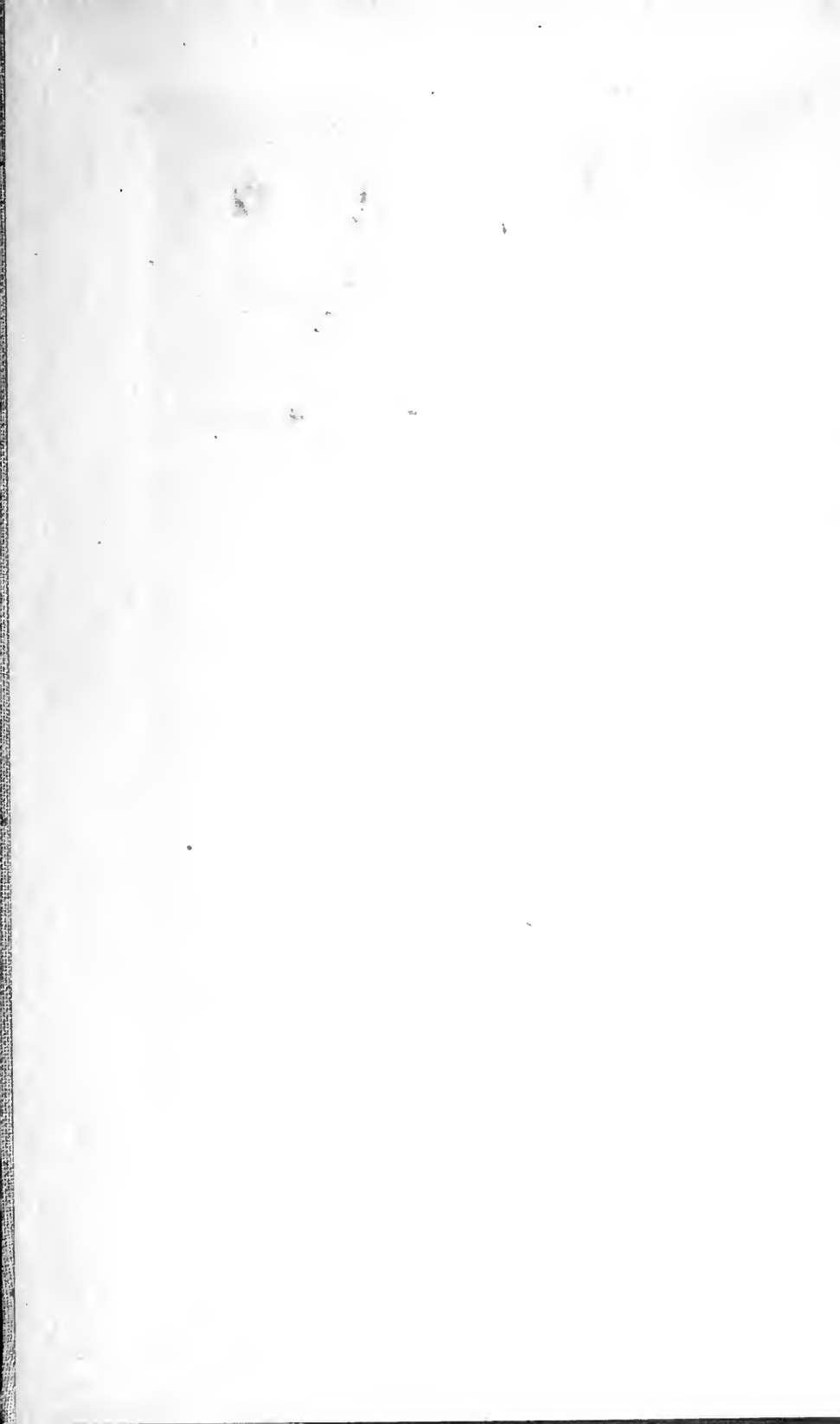
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